THEATRE CATALOG

12th ANNUAL ALL NEW EDITION

1954-55

Featuring:
A SALUTE TO THE MOTION PICTURE ENGINEERS

THEATRE CATALOG

ARNOLD FARBER, *Editor*

•

Published by

JAY EMANUEL
PUBLICATIONS, INC.

Publishing Offices: 246-48 N. CLARION ST.
PHILADELPHIA 7, PENNA., U.S.A.

Other Offices

Eastern Advertising Office
229 W. 42nd St., New York 36, N. Y.

Midwest Advertising Office
333 N. Michigan Ave., Chicago 1, Ill.

West Coast Advertising Office
9075 W. Pico Blvd., Los Angeles 35, Calif.

JAY EMANUEL .....*Publisher*
PAUL J. GREENHALGH,
General Manager
HERBERT M. MILLER,
Editorial Consultant
MAX CADES.....*Business Manager*
ALBERT J. MARTIN..*Advertising Manager*
MARGUERITE GIBSON,
Circulation Manager
MELBURN O. SIMMONS
Field Representative

1954-55

TWELFTH
ANNUAL
EDITION

Copyright 1954 by Jay Emanuel Publications, Inc., Philadelphia 7, Pa. U.S.A.

All rights reserved. No portion of this book may
be reprinted without permission of the publisher.

Printed in the U.S.A.

Price: $5 a copy

(Foreign Shipments: $10 a copy)

EDITORIAL FOREWORD

This past year has seen every segment of the motion picture industry participating in a drama as exciting and engrossing as anything which has been portrayed on the screen; and it appears as if this real life saga about the business of make-believe is going to follow formula and have a happy ending.

The prophets of doom who painted gloom-streaked pictures of thousands of theatres being converted into parking lots and super markets, and of Hollywood being buried in a box called television without lifting a finger to prevent it, have taken their well deserved place beside those skeptics who said that talkies were a fad, that the airplane would never fly, and the horseless carriage was just a passing fancy. Their fears, doubts, grim statistics and predictions have been washed away by a flood of progress that today finds the film industry on the brink of a new age of prosperity.

As the reader well knows, when the last edition of THEATRE CATALOG appeared, the general picture was one of confusion and a groping towards ways and means of harnessing the new tools which had been forged out of the realization that the industry desperately needed a change.

At first it appeared as if the struggle would be between the wide screen and 3-D as to which would be the new standard. However, the Supreme Court of opinion, the Public, quickly decided that width rather than depth, was the dimension they were most interested in seeing on the screen.

Starting with "The Robe," CinemaScope productions began to roll up record grosses all over the world, and the race to install this exciting form of screen presentation was on. However, an unsuspected source of friction arose which created sparks that, at times, threatened to send the entire operation up in flames.

To install CinemaScope with or without stereophonic sound? This was a question which had to be answered if the confusion and chaos were to be ended. Having taken one of the most daring gambles in the industry's history by converting its entire multi-million dollar operation to CinemaScope before the anamorphic process had even been seen by the industry or the public, 20th Century-Fox insisted that the system only be used in conjunction with full four-track magnetic stereophonic sound. The drive-in and small theatre operators just as firmly insisted that it was either too expensive, or too impractical for them to install directional sound equipment.

The battle waged hot and heavy, with neither side showing any sign of retreating from its announced position. However, in the Summer of 1954, Spyros Skouras, president of 20th-Fox, announced that the ban on CinemaScope productions without stereophonic sound was being lifted. This was indeed a major step towards bringing a sense of order to the exciting, but oft times confusing situation.

While most of the attention was focused on the CinemaScope problem, there were other events of interest and importance taking place. The only major studio not to use the anamorphic process was Paramount Pictures. The reason for their abstaining was revealed in early 1954 when the development of the VistaVision process was announced. By turning the motion picture camera on its side and making use of a film negative two and one-half the size of standard 35mm film, Paramount was able to achieve a wide screen picture that had tremendous depth of focus and clarity. The large negative was turned 90 degrees and printed down to the standard 35mm release size, thus requiring nothing other than a wide angle lens for projection.

As this issue goes to press the latest development concerning VistaVision is the use of horizontal projectors and the full-sized VistaVision print. The early reports indicate that the results are startling, but at this writing it is too early to evaluate the importance of this innovation.

At approximately the same time that Paramount announced its wide screen system, the development of an optical directional sound system was heralded. Called Perspecta Sound this is a method of achieving a stereophonic sound effect with a standard optical soundhead and a special integrator unit. The heart of the system is a sub-audible signal on the sound track which activates the system when the integrator is used.

With still another weapon in the rapidly increasing arsenal of new weapons designed to destroy the post-war business slump which attacked the industry, production and exhibition began making use of these devices. Films such as "The High And The Mighty," "Three Coins In The Fountain," "White Christmas," "A Star Is Born," and many others pumped new life into the theatres The theory that quality films shown in a new shape would be more than a match for television, proved to be correct.

Many of the questions which were only half formed last year have been answered. As has always been the goal of THEATRE CATALOG's staff, it is our belief that by the time the reader closes the cover on this 12th Edition, he will have found the information necessary to take the fullest advantage of the strides that have been made.

1954-55

TABLE of CONTENTS

Editorial Surveys •

FRONTISPIECE I

EDITORIAL FOREWORD III

AUTHORS AND CONTRIBUTORS VI

ADVERTISERS VII

EDITORIAL FEATURE: A SALUTE TO THE MOTION PICTURE ENGINEERS IX

BOOK ONE:

DESIGN AND CONSTRUCTION

Design

THE CENTRE: A SYMBOL OF PROGRESS 2
Constructed at a Cost of $1,000,000, Denver's Centre Theatre Represents the Finest in Modern Theatre Design and Operation

WORLD THEATRE SURVEY 6
Study of New Theatre Construction and General Conditions Currently Found in Various Countries Throughout the World

THEATRE CONSTRUCTION IN JAPAN....*Michiro Tomono* 20
A Complete Survey of the Motion Picture Theatre Construction Activities and General Industry Conditions in Post-War Japan

THE CINEMA: A MODEL THEATRE 32
Small Canadian Town Can Boast of Its New Theatre Equipped to Show All of the Latest Projection and Sound Techniques

Construction and Materials

PLYWOOD GOES TO THE THEATRE.....*Robert E. Eskew* 36
Review of the Many Uses to Which the Versatile Plywood Material May Be Adapted In Indoor and Outdoor Theatres

PAINT FIRE HAZARDS AWAY.....*A. Sophir* 41
A Discussion of Some Common Causes of Theatre Fires and How Fire Retardant Paints Can Lessen the Danger

ORIENTAL MOVIE PALACE.....*Chien Sing Shou* 44
A Thorough Description of the Equipment and Design of the Hoover Theatre in Hong Kong, One of the Orient's Finest, Newest Theatres

1953-54 REVIEW OF THEATRE CONSTRUCTION 48

CARIB, Clearwater, Fla. 49
MONTROSE, Montreal, Quebec, Canada 52
MAJESTIC, Hebron, Nebr. 54
CINE TROPICAL, Acapulco, Mexico 56
FILM CENTRE, Baltimore, Md. 59
CARSON, Carson City, Nev. 60
FITCHBURG, Fitchburg, Mass. 63
PLAZA, Vernon, Tex. 64
STATE, Raleigh, N. C. 66
CHICAGO, Chicago, Ill. 68
CINDERELLA, Detroit, Mich. 70
FOX, Sidney, Nebr. 72
CENTURY, Flushing, L. I., N. Y. 75
NEW MOON D. I., Lake Charles, La. 76
ABC D. I., Oxon, Md. 80
SUNDOWN D. I., Whittier, Calif. 83
CLACO D. I., Liberty, Mo. 84
WADSWORTH D. I., Denver, Colo. 87
NORTH ANDREWS D. I., Ft. Lauderdale, Fla. 90
MOTOR VU D. I., Dallas, Oregon 92
BROKEN BOW D. I., Broken Bow, Nebr. 94
WESTBURY D. I., Westbury, L. I., N. Y. 98
FAMILY DRI-VIN, Tigard, Ore. 100
HILLSIDE D. I., Hillside, Md. 102
STARLITE D. I., Lansing, Mich. 104
REDA D. I., London, Ky. 107
CENTENNIAL D. I., Littleton, Colo. 108
DRUID HILL D. I., Maryville, Tenn. 110
SUNDOWN D. I., Mandan, N. D. 112

Drive-In Theatres

PANAMA'S FIRST DRIVE-IN.....*J. L. Putaturo* 114
Step-By Step Study of the Planning and Construction of the First Drive-In Theatre to be Built in Panama

WIDE SCREENS FOR DRIVE-INS.....*John Selby* 118
An Analysis of the Various Factors to be Considered in Construction of Wide Screen Towers for Drive-Ins

PAINTING THE DRIVE-IN.....*Michael E. Spatz* 120
The Proper Use of Paints and Color at the Outdoor Theatre Often Results in an Increase in Activity at the Boxoffice

HEATING THE DRIVE-IN.....*E. A. Farr* 122
Use of In-Car Heaters for Outdoor Theatres Can Make It Possible to Extend the Drive-In Season

CHEMICAL FLY SWATTERS 124
Drive-Ins That Use Recently Developed Chemicals, and Proper Sanitation Procedures Eliminate Danger of Weeds and Insects

SWIMMING POOLS FOR OUTDOOR THEATRES
Wesley Bintz 127
Complete Information on Swimming Pool Construction, and How It Might Apply to the Community-Center Type of Drive-In Operation

BLACK LIGHT PEST CONTROL 134
A New Device Which Uses Black Light and an Electric Grid to Eliminate the Problem of Night-Flying Insects at D-I's

CHILDREN ARE YOUR BEST SALESMEN....*Claude Ahrens* 136
The Proper Equipment and Operation of a Playground is a Positive Method of Attracting the Kids and Their Parents to Your Drive-In

OUTDOOR SCREEN ADVERTISING 138
An Attempt to Better Acquaint the Drive-In Operator with the Subject of Theatre Screen Advertising Films

BOOK TWO:

EQUIPMENT

Front and Lobby

LIGHTING INDOOR AND OUTDOOR THEATRES
George T. Howard 154
Through Study of Various Types of Reflector and Projector Floodlighting Lamps, and How They May Be Used in a Theatre

THEATRE TURNSTILE SYSTEM 162
Theatre Turnstiles Offer an Efficient Admissions System that Will Only Require the Services of a Single Employee

AUTOMATIC DOOR OPENERS.....*Barry Johnson* 164
The Use of an Automatic Door Operator in a Theatre Can Result in an Increase in Patronage, Profits and Safety

WIDE ANGLE SLIDE PROJECTOR .....*J. P. Latil* 167
A Discussion of the Construction Details and Uses for Recently Developed 3000 Watts Slide Projector

CLAY TILE FOR THEATRES.....*Al Frantz* 170
A Review of the Many Uses and Advantages of Clay Material in Construction and Operation of a Motion Picture Theatre

Interior and Auditorium

SUPPORTING AND CONTROLLING WIDE SCREEN CURTAINS.....*Abram Samuels* 180
The Problems Involved in Installation of Curved and Straight Track for Wide Screen Curtains are Given With Their Answers

LOUNGE LUXURY.....*Barclay Adams* 187
Luxurious Lounge Areas are an Important Feature of Today's Modern Motion Picture Theatre Architecture

FOUNTAIN OF YOUTH FOR CARPETS.....*Fred C. Hild* 192
A Description of the Process Which Makes it Possible to Restore the Original Colors to Still Sturdy but Faded Theatre Carpeting

WIDE SCREEN FRAMES.....*C. E. Tompkins* 194
A Look at Some of the Problems Involved in the Use of Curved and Straight Screen Frames With Various Wide Screen Systems

STAINPROOF WALL COVERING.....*John E. Williams* 196
This Wallpaper Resists Stains and Wear, and is Easily Cleaned Making It Ideal for Use in Many Parts of the Theatre Building

HOME BEAUTY TREATMENT FOR THEATRES 201
A Look at the Various Uses to Which Plastic Wall Tile May be Put in Theatres, and Installation Instructions

Projection and Sound

INSTALLING CINEMASCOPE 220
Thorough and Detailed Review of Equipment Required, Installation Procedures, Maintenance, and Operating Practices for CinemaScope

THE PARAMOUNT VISTAVISION PROCESS 232
A Detailed Study of the Theatrical and Studio Applications of this Wide Screen Process with the Double-Frame Negative

WIDE SCREEN LIGHT REQUIREMENTS.....*Arthur J. Hatch* 238
An Analysis of the Light Requirements Necessary in Order to Project the Various Wide Screen Systems Satisfactorily

BASIC PRINCIPLES OF STEREOPHONIC SOUND
William B. Snow 241
An Important and Fundamental Study of the Principles of Stereophonic Sound is Offered by A Leading Sound Expert

PERSPECTA STEREOPHONIC SOUND...*Charles J. Bachman* 251
Study of the Basic Principles and the Equipment Required to Obtain Stereophonic Sound from A Single Optical Track

CARBONS FOR THE NEW SYSTEMS
F. P. Holloway, R. M. Bushong, W. W. Lozier 253
An Analysis of the New Systems' Demand for More Projection Light, and Some of the Carbons Developed to Meet This Demand

PROJECTION ARC LAMP REVIEW 256
A Survey of the Latest Advances Made in Projection Arc Lamps Plus Information on Proper Installation, Operation, and Care

MOTION PICTURE SCREEN REVIEW 263
A Survey of the Various Types of Screens Presently Available and the Various Features and Advantages to be Found in Each

ASTROLITE REFLECTION THEORY.....*John L. Curtin* 267
Complete Study of the Theory Behind the Development of the Astrolite Screen, and Its Adaptability to the New Systems

TODAY'S RECTIFIER FOR TOMORROW'S ARC, *M. D. Faige* 273
An Analysis of the Design, Construction and Operation of a Selenium Rectifier Developed with Features for the Future

EFFECTS OF STRAY LIGHT ON PICTURE QUALITY
Raymond L. Estes 275
A Comprehensive Study of the Influence of Stray Light on the Quality of Indoor and of Drive-In Projected Pictures

SINGLE STRIP 3-D 281
An Examination of Two of the Leading Methods of Obtaining Three-Dimensional Pictures on a Single Strip of 35MM Film

CHANGING SERVICE SCENE.....*Bert Ennis* 285
A Summation of the Advances Made by a Leading Sound Service Organization, and a Review of the Latest Methods Now in Use

THE PICTURE BRIGHTENS.....*Edward Lachman* 289
Summary of the Early Development of One of the Leading Carbons and Its Role in Lighting New Screen Dimensions

A LAMP FOR THE NEW DIMENSIONS.....*J. W. Servies* 291
A Description of the National Excelite Projection Arc Lamps and Its New Design to Meet Demand for More Light

BOOK THREE:

MANAGEMENT

Methods, Practices, and Maintenance

AIR CONDITIONING: A VITAL LUXURY 322
Three Leading Manufacturers Offer Important Information About Air Conditioning and its Vital Role in Exhibition

THEATRE HEATING AND COOLING SYSTEMS
C. F. Craigie, Jr. 329
Valuable Information About the Operation and Maintenance of Heating and Cooling Systems in Motion Picture Theatres

BE UNIFORM WISE.....*Howard A. Zeimer* 332
A Discussion of the Latest Trends in Uniforms for the Theatre Staff, Plus Hints on Styles and Proper Maintenance Procedures

THEATRE AIR CONDITIONING.....*R. D .McLain* 335
A Review of Basic Air Conditioning Systems and A Summary of the Latest Advances Made in Equipment

KEEP THEATRE AIR CLEAN..... 339
Electronic Cleaning of Air in a Theatre, Can Mean Increased Patronage and Reduced Maintenance Costs

THEATRE FIRE PROTECTION.....*Walter E. Morgan* 341
The Vital Task of Knowing What to Do In Case of Fire and the Equipment Needed is Outlined

FURNITURE RESTS CAN SAVE FLOORS..... 344
The Use of Simple and Inexpensive Furniture Rests in Theatres can Sharply Reduce Repairs and Replacement of Floor Coverings

NETWORKS FOR THEATRE TELEVISION.....*C. A. Bartlett* 345
A Study of the Bell System's Part in Providing Channels to be Used for Theatre Television Network Transmissions

New Products, Supplies and Supply Dealers

NEW INTRODUCTIONS DURING 1953-54..... 356
Some Thumbnail Descriptions of Selected Products with Interesting Possibilities

SUPPLY DEALERS OF THE UNITED STATES..... 363
Comprehensive Listing of Names, Addresses, Personnel, Products, and the Areas Served

SUPPLY DEALERS OF THE DOMINION OF CANADA..... 372
Comprehensive Listing of Names, Addresses, Personnel, Products, and the Areas Served

SUPPLY DEALERS OF THE REST OF THE WORLD..... 373
Comprehensive Listing of Names, Addresses, Personnel, Products, and the Areas Served

Extra Profits

LIQUID ASSETS 384
Proper Equipment and Correct Sales Approach Can Make Beverages One of the Most Popular, and Profitable Concession Stand Items

CONCESSION MERCHANDISING.....*Ralph Pries* 389
Proper Exploitation of the Angles at a Theatre's Snack Bar Will Mean an Increase in Extra Profits

CONCESSIONAIRES VS. SELF-OPERATION.....*Philip Kates* 393
The Advantages of Both Types of Management in Extra Profits Departments are Carefully Treated by an Expert in the Field

Indexes

COMPLETE SUBJECT INDEX TO 1954-55 EDITION..... 400
The Entire Editorial Material is Indexed and Cross Indexed for Easy Reference Use

CUMULATIVE INDEX TO ALL PREVIOUS EDITIONS..... 402
Topical References to All Articles Published in Prior Volumes of THEATRE CATALOG

Authors and Contributors •

A

ADAMS, BABCLAY 187
Executive Director, American Society of Design, New York, N. Y.

AHRENS, CLAUDE 136
President, Miracle Whirl Sales Co., Grinnell, Iowa

ALLEN, VICTOR H. IX
Editor, SMPTE Journal, New York, N. Y.

ASHCRAFT, C S. 256
President, C. S. Ashcraft Mfg. Co., Long Island City, N. Y.

B

BACHMAN, CHARLES J. 251
Theatre Equipment Products Manager, Fairchild Recording Equip. Co., Whitestone, L. I., N. Y.

BARONAT, FORTUNAT 6
Universal-International Films, Inc., New York, N. Y.

BARTLETT, C. A. 345
Engineer, Long Lines Department, American Telephone and Telegraph Co., New York, N. Y.

BERG, HERB 281
Publicity Director, Pola-Lite Co., New York, N. Y.

BINTZ, WESLEY 127
Consulting Engineer, Lansing, Mich.

BIXBY, JERRY 322
Publicity Department, Typhoon Air Conditioning, Brooklyn, N. Y.

BLACKBURN, JAMES 104
Starlite Drive-In, Lansing, Mich.

BODDE, B. M., JR. 263
Bodde Screen Company, Los Angeles, Calif.

BOWEN, A. R. 60
Carson Theatre, Carson City, Nev.

BOYLE, FRANK 63
Fitchburg Theatre, Fitchburg, Mass.

BRUEN, HUGH W. 83
Sundown Drive-In, Whittier, Calif.

BUSHONG, R. M. 253
National Carbon Company, New York, N. Y.

C

CALLARD, GEORGE A 384
The Coca-Cola Company, Baltimore, Md.

CANDLER, E. S. 384
Fountain Sales Department, Coca-Cola Co., Atlanta, Ga.

COLLIER, ROBERT 84
Claco Drive-In, Liberty, Mo.

COTT, W. B. 322
Air Conditioning Division, Westinghouse Electric Corporation, Boston, Mass.

COURTNEY, DENNIS A. IX
Advertising Manager, SMPTE, New York, N. Y.

CRAIGIE, C. F., JR. 329
Plumbing and Heating Industries Bureau, Chicago, Ill.

CURTIN, JOHN L. 267
Research Director, Glowmeter Corporation, N. Tonnawanda, N. Y.

D

DEMSHKI, ROBERT 108
TV Theatres, Inc., Denver, Colo.

DUNN, WALTER E. 75
Century Theatres, Queens Village, N. Y.

E

ELROD, PAUL G. 110
Druid Hill Drive-In, Maryville, Tenn.

ENNIS, BERT 285
Publicity Director, Altec Service Corp., New York, N. Y.

EPLEE, H. ROBERT 134
Futuramic Equipment Company, Philadelphia, Pa.

ESKEW, ROBERT E. 36
Publicity Department, Douglas Fir Plywood Assoc., Tacoma, Wash.

ESTES, RAYMOND L. 275
Film Testing Division, Eastman Kodak Company, Rochester, N. Y.

F

FAIGE, M. D. 273
President, Norpat Sales Company, New York, N. Y.

FARR, E. A 122
Chief Engineer, Arvin Industries, Inc., Columbus, Ind.

FLOYD, CARL 49
President, Bay Lan Theatres, Haines City, Fla.

FRANTZ, AL 170
Public Relations, Tile Council of America, New York, N. Y.

FRAYNE, JOHN G. 6
Vice President, Westrex Corporation, New York, N. Y.

G

GEORGE, WES 201
Advertising Manager, Hachmeister, Inc., Pittsburgh, Pa.

GIFFORD, P. L. 162
Advertising Manager, Perey Mfg. Company, New York, N. Y.

GORHAM, ALICE N. 70
United Detroit Theatre Corporation, Detroit, Mich..

H

HAHN, CHARLES 256
J. E. McAuley Mfg. Company, Chicago, Ill.

HATCH, ARTHUR J. 238, 256
Engineering Vice President, Strong Electric Corp., Toledo, Ohio

HECK, GIL 263
Da-Lite Screen Company, Chicago, Ill.

HENKEN, HERMAN 256, 263
Engineering Products Division, RCA, Camden, N. J.

HILD, FRED C. 192
President, Hild Floor Machine Co., Chicago, Ill.

HOLLOWAY, F. P. 253
National Carbon Company, New York, N. Y.

HOWARD, GEORGE T. 154
Lamp Division, General Electric Company, Nela Park, Cleveland, Ohio

I

ITO, HARUSUKE 20
Nihon Eiga Shisai Co., Ltd., Tokyo, Japan

J

JOHNSON, BARRY 164
Dor-O-Matic Division of Republic Industries, Inc., Chicago, Ill.

JORDON, SANFORD 66
State Theatre, Raleigh, N. C.

K

KATES, PHILIP 393
Theatre Confections, Rochester, N. Y.

KENNEDY, HOWARD C. 94
Bow and Lyric Theatres, Broken Bow, Nebr.

KLEINMAN, MAURICE 76
New Moon Twin Drive-In, Lake Charles, La.

KRIEBEL, RICHARD T. 281
Director Public Relations, Polaroid Corp., Cambridge, Mass.

L

LACHMAN, EDWARD 289
President, Lorraine Carbons, Inc., Boonton, N. J.

LATIL, J. P. 167
President, Genarco, Inc., Jamaica, N. Y.

LERNER, SAUL 98
Westbury Drive-In, Westbury, L. I., N. Y.

LOHMAN, ARTHUR J. 335
J. P. Lohman Organization, New York, N. Y.

LOVE, VICTOR E 87
Publicity, Denver, Colo.

LOZIER, W. W. 253
National Carbon Company, New York, N. Y.

LUST, SIDNEY 102
Sidney Lust Theatres, Washington, D. C.

M

MCGARRY, J. L. 322
Merchandising Dept., Chrysler Corp., Airtemp Div., Dayton, Ohio

MCLAIN, R. D. 322
Manager, Central Packaged Div., United States Air Conditioning orp., St. Paul, Minn.

MELLOTT, DOUGLAS 80
ABC Drive-In, Oxon, Md.

MORGAN, J. J. 263
Sales Manager, Williams Screen Company, Akron, Ohio

MORGAN, WALTER E. 341
Industrial Dept. Manager, Walter Kidde and Company, Inc., Belleville, N. J.

MUNSELL, ARTHUR 263
Vocalite Screen Corporation, Roosevelt, N. Y.

N

NEMEC, BOYCE IX
Executive Secretary, SMPTE, New York, N. Y.

O

PALMER, FRED 64
Plaza Theatre, Vernon, Tex.

PETZGOLD, KEITH 100
Jesse Jones Theatres, Portland, Ore.

PRIES, RALPH 389
Berlo Vending Company, Philadelphia, Pa.

PUTATURO, J. L. 114
Vice President, Cia. Panamena De Diversiones, Panama, R. P.

Q

QUIROGA, JOSE A. 56
Mexico City, Mexico

R

REDA, ERNIE 107
Reda Drive-In, London, Ky.

S

SAMUELS, ABRAM 130
President, Automatic Devices Company, Allentown, Pa.

SATZ, LEONARD 263
Raytone Screen Company, Brooklyn, N. Y.

SELBY, JOHN 118
President, Selby Industries, Inc., Akron, Ohio

SERVIES, J. W. 291
Vice President, National Theatre Supply, New York, N. Y.

SHERMAN, MILT 263
Publicity, Chicago, Ill.

SHOU CHIEN SING 44
Hong Kong

SNOW, WILLIAM B. 241
Consulting Engineer, Santa Monica, Calif.

SOPHIR, A 41
Fyr-Koto Div., Morris Paint and Varnish Co., Omaha, Nebr.

SOULE, GEORGE H. 124
Public Relations Dept., E. I. DuPont De Nemours & Company, Wilmington Del.

SPATZ, MICHAEL E. 120
President, Spatz Paint Industries, Inc., St. Louis, Mo.

STRENG, C. D. 72
Architect, Denver, Colo.

STROH, ROBERT 384
The Coca Cola Company, Baltimore, Md.

STRUVE, HAROLD 54
Ritz Theatre, Deshler, Nebr.

SWEITZER, RICHARD E. 339
Sales Promotion Manager, Trion, Inc., McKees Rock, Pa.

T

TOMONO, MICHIRO 20
Architect, Takenaka-Komuton Co., Ltd., Tokyo, Japan

TOMPKINS, C. E. 194
President, J. R. Clancy, Inc., Syracuse, N. Y.

TREBOW, A. L. 68
Balaban and Katz Management Corporation, Chicago, Ill.

W

WALKER, RICHARD L. 263
Walker American Corporation, St. Louis, Mo.

WEBBER, R. G. 32
Contract Division, Robert Simpson Western Ltd., Regina, Canada

WERNIL, D. E. 92
Motor Vu Theatres, Dallas, Ore.

WETZSTEIN, F. E. 112
Sundown Drive-In, Mandan, N. D.

WILLIAMS, JOHN E. 196
General Manager, Varlar Division, United Wallpaper, Inc., Chicago, Ill.

Z

ZEIMER, HOWARD A. 332
Sales Manager, Delta Uniforms, New York, N. Y.

Advertisers •

A

ABBOTT THEATRE EQUIPMENT CO. 365
ADAM, FRANK, ELECTRIC CO. 205
ADLER SILHOUETTE LETTER CO. 176
ALTEC SERVICE CORP. 353
ALEXANDER THEATRE SUPPLY, INC. 369
AMERICAN PLAYGROUND DEVICE CO. 146
AMERICAN SEATING CO. 214
ASHCRAFT, C. S., MANUFACTURING CO., INC. 306

B

BALLANTYNE CO., THE 303
BAUSCH AND LOMB OPTICAL CO. 310
BEVELITE 173
BERLO VENDING CO. 398
BLUMBERG BROTHERS, INC. 369
BRIENT, ELMER H., AND SONS, INC. 364

C

CAPITOL THEATRE SUPPLY CO. 366
CENTURY PROJECTION CORP. 302
CLANCY, J. R., INC. 209
COCA-COLA CO., THE 397

D

DAWO CORP. 149
DAYTON SAFETY LADDER CO. 352
DIT-MCO, INC. 142, 143
DOMINION SOUND EQUIPMENTS LTD. 372
DRIVE-IN THEATRE MANUFACTURING CO. 142, 143

E

EPRAD 151
EASTERN THEATRE SUPPLY CO., INC. 367

Electric-Aire Engineering Corp. 349
Excelite 308
Exhibitor, Motion Picture 382

F

Falls City Theatre Equipment Co. 365
Federal Pacific Electric Co. 208
First-American Products, Inc. 144, 145
Futter, Walter 320
Futuramic Equipment Co. 152

G

General Electric Co. (Lamp Div.) 350
Goldberg Brothers 351

H

Hardin Theatre Supply Co. 370
Hertner Electric Co., The 309
Hewitt-Robins, Inc. (Restfoam Div.) 212
Heywood-Wakefield Co. (Theatre Seating Div.) 216
Hornstein, Joe, Inc. (Miami) 364
Hornstein, Joe, Inc. (New York) 367

I

I. A. T. S. E. XXXII
Ideal Seating Co. 218
International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the United States and Canada XXXII
International Projector Corp. 141, 305

K

Knoxville Scenic Studios, Inc. 211
Koiled Kords, Inc. 147
Kollmorgen Optical Corp. 312

L

La Vezzi Machine Works 314

M

Maharam Fabric Corp. 215
McAuley, J. E. Manufacturing Co. 307
Miracle Whirl Sales Co. 150
Modern Theatre Equipment Co. 370
Monarch Theatre Supply, Inc. 370
Motiograph, Inc. 296, 297

N

National Carbon Co. 319
National Screen Service Corp. 354
National Super Service Co., Inc. 217
National Theatre Supply 141, 304, 305, 308, 309, 318, 362
National Theatre Supply Export 377
Norpat Sales, Inc. 311
Novelty Scenic Studios, Inc. 213

P

Perey Manufacturing Co., Inc. 177

Q

Queen Feature Service, Inc., The 363

R

Radiant Manufacturing Co. 316
Radio Corp. of America (RCA International Div.) 379
Radio Corp. of America (RCA Theatre Equipment) 298, 299
Raytone Screen Corp. 317
Restfoam Div., Hewitt-Robins, Inc. 212
Robin, J. E., Inc. 300, 301

S

S.O.S. Cinema Supply Corp. 368
Southeastern Theatre Equipment Co. (Atlanta) 364
Southeastern Theatre Equipment Co. of Florida 364
Southeastern Theatre Equipment Co. of Louisiana 366
Southeastern Theatre Equipment Co. of North Carolina... 368
Standard Theatre Supply Co. 368
Strong Electric Corp., The 294, 295
Superior Electric Co., The 210

T

Tate, Vincent M., Theatre Equipment 369
Theatre Equipment Co. 151
Theatre Specialties, Inc. 173
Tri-State Theatre Supply 370

U

Union Carbide and Carbon Corp. 319
Universal Corp. 178

V

Vocalite Screen Corp. 315

W

Wagner Sign Service, Inc. 174, 175
Walker Screen Co. 318
Ward Leonard Electric Co. 206, 207
Westrex Corp. 381
Whitney Blake Co. 148
Wil-Kin Theatre Supply, Inc. (Atlanta) 365
Wil-Kin Theatre Supply, Inc. (Charlotte) 368
Williams Screen Co. 313

A Salute to the

MOTION PICTURE ENGINEERS

1954-55



66 Years of Technical Development

SINCE the original efforts of Thomas Alva Edison to develop motion pictures, until today, it has always been the role of the engineer to work towards the improvement and advancement of the art of motion picture presentation.

The Society of Motion Picture and Television Engineers has put 38 years of vigorous growth into becoming the worldwide technical leader of the industry. For thousands of engineers, producers, suppliers and technicians in the cinema and television industries the word is contained in the Journal of the SMPTE. The facts they find there, and the organization that stands behind it, have significance and importance for all those concerned with the motion-picture business.

Technical societies, by and large, suggest respectability and are felt to be, in a sense, indicators of the validity and stability of the industry they service. Our industry. being a late starter in the scientific field, had certainly not reached any great degree of gravity or honor when a small group of sincere and far-seeing engineers met together in 1916 to found the Society of Motion Picture Engineers.

Motion pictures were the "movies," a term, as the Society's first president put it in 1918, "of derision, though the term is so expressive that eventually it will be accepted in our language and appear in standard dictionaries, but at present a term of mild contempt, nevertheless." Indeed, the days were not long past when one of the commonest uses of the "flickers" was as short subjects put on in vaudeville houses to clear the house between shows, since it was felt that no audience could stand to watch them for more than 10 minutes.

WHILE THE EFFORTS of Thomas A. Edison were a good 22 years (1894) before the formal founding of the Society of Motion Picture and Television Engineers (1916), the kinship of development and constant striving for perfection must always place him in the very front rank of this industry's engineering contributors. He is here pictured in his laboratory with experimental projector of 1897.

Progress Being Made

But progress was being made, and when one of the pioneers of the film industry, C. Francis Jenkins, issued his call for a few engineers interested in the motion-picture business to come together at the Hotel Astor, in New York, and review the needs of the infant industry, the vigorous experimentation and development then going forward on all

PESSIMISTIC about the public acceptance of his first 25 Kinetographs "with a nickel slot attachment, Edison wrote this longhand note.

sides made coordination and standardization increasingly urgent. In all the welter of new camera and projection equipment the only feature that could be pointed to as relatively standard was the film itself. Even here, the great variety of perforation gauges and dimensional irregularities often encountered in the same film strip, combined with the wide differences of frame line in various cameras, strewed the operator's path with hazards.

Aim of the Society

The Society, organized with 25 members, took for its aim: "*The advancement in the theory and practice of motion-picture engineering and the allied arts and sciences, the standardization of the mechanisms and practices employed therein and the maintenance of a high professional standing among its members.*" Important as standardization was, and especially in that period of terrific growth, the founders saw the objectives as being wider and even more generally beneficial. Jenkins himself said:

> **". . . the Society of Motion Picture Engineers is not a judicial body to settle controversies between conflicting interests or to promulgate recommendations which make for class-discrimination . . . What we did organize for was to set our official seal on standards generally recognized as standards; and second, and perhaps best of all, to put into permanent form for world-wide distribution the specialized knowledge which our members, experts in their particular line, are so unselfishly furnishing for this purpose. And while the official stamping of generally acknowledged standards is a necessary duty, for myself I have found the most interest in our meetings has come from the valuable papers read and printed."**

During the years that followed, this principle of the dissemination of scientific knowledge inspired the increasing bulk of the published *Transactions*, which contained the papers that were presented, and the discussions that took place, at the semiannual meetings of the Society. By 1930, when the contribution of the engineers to the industry had been made more dramatically apparent by the introduction of sound, the Society had expanded to such an extent that it was decided henceforth to publish a monthly *Journal* which would give greater scope than the *Transactions* for achieving the Society's aims.

An End to Confusion

But in the beginning it was above all the desperate need for putting some order

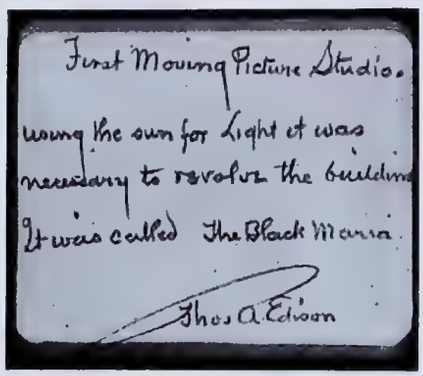
into the scattered efforts of the industry that caused the most concern. At the very first formal meeting of the newly founded Society the place of honor at the head of the program was given to an address by the Secretary of the National Bureau of Standards on the universal scientific necessity of conforming to recognized standards. The motion-picture industry wac one that was destined to travel to all parts of the world; everywhere its success would depend on the successful coordination of the same basic factors of equipment, lighting and theatre planning. Photography, architecture, illumination, the drama, were all involved, though their eventual individual significance as integrated components of the evolving art of the motion picture was as yet but dimly seen. The young Society made it its business to look forward without ceasing to the rationalization and improvement of the industry.

It makes interesting reading, for instance, that among the multifarious objectives so brashly perceived in the year 1916 was the creation of:

". . . an ideal atmosphere within the theatre. It is a problem of hygiene to ascertain numerically the factors needed by the engineer to provide such a standard ideal atmosphere. It may eventually include the best temperature, abundant fresh air, and also the cooling and drying of the air when required, making it dust free, circulating it, and possibly giving it a healthful trace of ozone and the fragrance of the woods. This may be looking a long way ahead, but vision is required in such matters."

It *was* a long way ahead to air conditioning, but they had the idea.

But very soon the founding engineers had got down to work on specific problems that demanded immediate attention. Film size, sprocket size, frame rate, had all to be determined for the best. No material change had been made in the mechanism and principle of projecting machines since the first such machine had been deposited in the U. S. National Museum more than 20 years before. Arcs, condenser lenses, aperture, tension plates, sprockets, lamphouse setting, lamp location, all called for development. A Committee on Electrical Devices explored the performance of arcs using alternating and direct current; a Committee on Optics looked into focal lengths and aperture size. By the fall meeting of 1917, one year after the founding of the Society, detailed consideration had reached such a stage that no less than 80 highly technical papers were presented on such subjects as the optical requirements of motion-picture projection objectives, artificial light in the studio, condencers, portable projectors and incandescent lamps.



THE "BLACK MARIA" erected on the grounds of Edison's West Orange Laboratory was completed February 1, 1893, and was the world's first motion picture studio. Above, is Edison's own handwritten note regarding the studio's design.

The President reported in 1918:

"And there is a wonderful collection of data already collated. Do you want to know the percentage of loss of light by reason of the tinting of films—it is in the *Transactions*. Do you want to know the distortion error due to angular projection—it is in the book! Do you want to know the source of loss of light at various points in the optical system—it is in your own printed copy. Do you want to know the cause of the strobscope effect of shutters—it is in the booklet sent to our members. Do you want to know the proper current density for carbon arcs —reach for the bound volume. Do you want to know the advantages and disadvantages of various electric current devices—it is in the unselfish report of that Committee."

At the 1918 meeting came news of one of the major steps in the march of progrens. Natural color cinematography was still far off in realization, but its principles were being actively investigated. Single-coated emulsion, as in the Dufay patent, the Fox system of two emulsions on one side, and the double-coated emulsion, were all being tested. The names of Fox, Crabtree and Ives in the United States, and Capstaff in England, began to appear. Among a host of competing systems on trial, Technicolor was mentioned for the first time.

Still in 1918, we find preoccupation with the development of a "slow-burning" film, at first meant primarily for use in narrow widths in small portable



projectors where haphazard use represented a more than ordinary danger of fire.

Joint Growth

As the industry grew, so did the Society. In the decade after 1916 the little group of original enthusiasts had swelled considerably, the semiannual meetings were recognized institutions at which the best brains in the industry gathered to learn, compare and criticize, and the published *Transactions* reflected the technical progress in so thorough a manner that the old issues can still often be profitably thumbed through for basic information useful in today's developments.

Looking back, it sometimes seems amazing that the principles of developments which came to fruition only much later should have been so well understood at such an early stage. At other times we are exasperated by the apparent unconcern of the engineers of those days for the vast changes that we now know to have been just around the corner. The 1925-1926 Progress Committee Report, for instance, starts out solemnly:

> "A study of the progress in the motion picture industry for the past six months reveals no outstanding developments of revolutionary nature. This industry, like the radio and automobile fields, appears to be entering upon a period of improvements and refinements."

Later in the same report, the brief statement is made:

> "A number of patents have been taken out for talking motion pictures. . . . A Swiss invention consists of a loud speaker operated through an amplifying circuit. A beam of light is controlled by a voice record placed along the edge of the film."

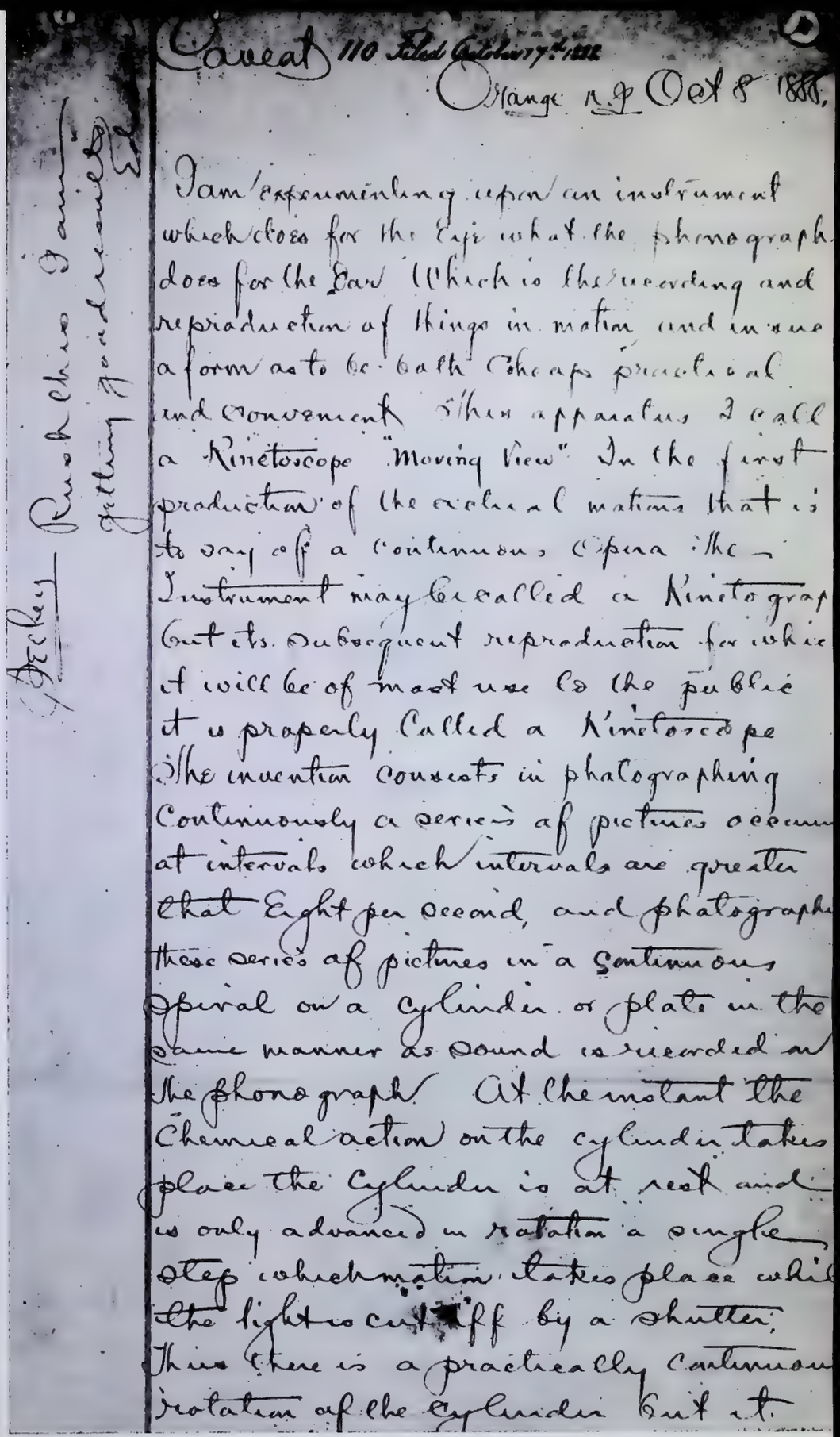
The same report, which finds so little of importance taking place, also notes:

> "The possibility of broadcasting motion pictures is now causing the producers of motion pictures to ask for further copyright protection. . . . A youthful British inventor claims to have produced a machine which makes possible the distinct reproduction of the sender's face, whereas almost all of the American developments simply transmit shadow images."

But this must have seemed a very distant bogy indeed.

Sound, on the other hand, really was just around the corner. Lee De Forest's paper in the *Transactions* in 1927 about his Vitaphone system was the precursor of a flood of technical information over the next few years that thoroughly documented the great innovation.

Those old *Transactions* of the Society contain an extraordinary amount of valuable material. The papers given at the semiannual meetings were published, also twice yearly, in two increasingly large volumes. All work connected with publishing these volumes—collecting and editing the papers, and preparing them for the printer, besides the voluminous correspondence that goes with such a job—was carried out on a voluntary basis by the officers, the bulk of it by the Chairman of the Publications Committee. By 1927 this unfortunate individual was vociferously complaining in his official reports that the work involved



Caveat 110 Filed October 7th 1888

Orange N.J. Oct 8 1888.

I am experimenting upon an instrument which does for the Eye what the phonograph does for the Ear Which is the recording and reproduction of things in motion and in such a form as to be both cheap practical and convenient This apparatus I call a Kinetoscope "Moving View" In the first production of the actual motions that is to say of a continuous Opera the Instrument may be called a Kinetograph but its subsequent reproduction for which it will be of most use to the public it is properly called a Kinetoscope The invention consists in photographing continuously a series of pictures actuated at intervals which intervals are greater that Eight per second, and photographs these series of pictures on a continuous spiral on a cylinder or plate in the same manner as sound is recorded on the phonograph At the instant the Chemical action on the cylinder takes place the cylinder is at rest and is only advanced in rotation a single step which rotation takes place while the light is cut off by a shutter. Thus there is a practically continuous rotation of the cylinder but it

FIRST PAGE OF THE FIRST caveat filed by Edison in 1888 covering his Kinetoscope portrays an interesting description of his efforts to record and reproduce pictures in motion after the fashion of his earlier successes with sound. Eight frames per minute was his standard speed.

was altogether too much to expect anyone to do who at the same time was supposed to be doing a full-time job for his own employer. The argument must have appeared a good one, because in 1930 for the first time the Society got itself a paid employee to act as general secretary in charge of its business and to edit and publish the new *Journal*, which took the place of the old *Transactions*.

The Journal Makes Its Bow

For at the same time that this change took place the old *Transactions*, which

had been published twice a year since 1916, was discontinued in favor of a regular monthly publication, the *Journal* of the Society. Carrying on the tradition of the *Transactions* in crisper format, and bringing its story regularly to the rapidly growing membership, this was the publication that was to earn the respect of serious workers in the industry and become one of the honored technical journals of the world.

The Society Continues to Grow

With the growth of the industry over the years the Society has grown too. The little group of founders back in 1916 had swelled to several hundred in the twenties. By World War II membership had reached about 1300. Since 1943 it has shot up at an impressive rate until today the Society has some 4800 members. In addition, more than 1200 individuals or institutions subscribe to its *Journal*. Not all of these, by any means, are in the United States. Around 1200 members and subscribers are spread throughout more than 50 countries outside the United States. The largest foreign groups are naturally to be found in Europe, and especially in England, but Asia also is well represented in the Society. India, the world's second largest producer of motion pictures, has a sizeable group; so have Japan and Australia.

ORGANIZATION STRUCTURE

The SMPTE is controlled by an elected Board of Governors and a roster of officers. An Engineering Vice-President supervises the work of the numerous engineering committees which plot the steady technical progress of the industry. An Editorial Vice-President, assisted by a Board of Editors, screens material for publication. All these services are performed voluntarily by leading figures in the industry. A headquarters staff, at 55 West 42nd Street, New York City, headed by an Executive Secretary, performs the daily chores of the Society in connection with membership, engineering committee work, test film production, editing the *Journal*, and the sale of advertising.

Active members are usually professional engineers or industrial executives; they vote in Society elections, may hold office and may be appointed chairmen of committees. Associate members are most often younger engineers and technical people. Associates may serve on committees and take part in local Section and convention activities, but they do not vote. The major qualification for membership in this grade is a serious interest in the technology of motion pictures, television or allied fields. Student members must be enrolled in accredited college courses or in qualified technical schools. They also receive the *Journal*, and while they may not vote in Society matters, they are given a substantial reduction in annual membership dues. For those students who are able to attend Society Conventions, the customary registration fees are waived.

Many business firms, including motion-picture studios and television stations, require that their engineers and executives hold Society membership. A majority of such companies, both large and small, require further that these members offer a portion of their time and their company's facilities to the engineering committees. In addition, these companies invest annually sums of money in Society work, through the medium of Sustaining Membership.

The two largest concentrations of its members are to be found in the New York and Los Angeles areas, of course. But there are many throughout the Middle West, and indeed some to be found in every state. Wherever lab men, engineers, technicians, suppliers, producers, theatremen—anyone genuinely interested in the welfare and development of the industry—are at work, members of the SMPTE will be found among them.

For greater convenience, and to make sure that the greatest number of individual members can get the benefits of an exchange of information and ideas, the country is divided up into Atlantic Coast Section, with headquarters in New York; the Central Section, in Chicago; the Pacific Coast Section, in Los Angeles; and Subsections in Atlanta, Dallas and San Francisco. In each of these sections the members have their own officers and organization, and hold regular meetings. At their meetings, which are friendly and informal, new ideas are discussed, original papers given, or sometimes papers from national conventions reproduced from tape.

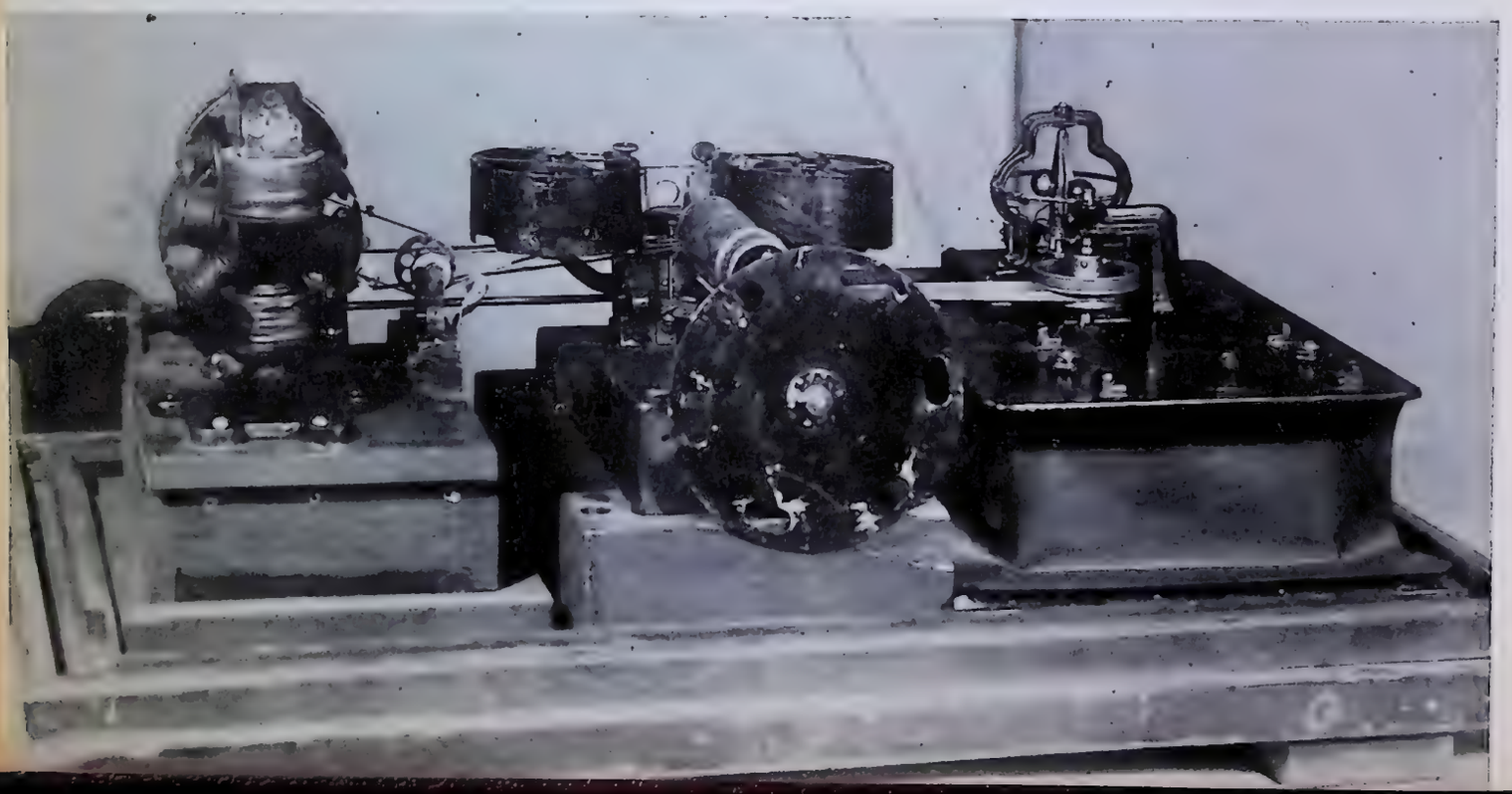
At the national meetings, which are held twice a year, as they have been since the beginning of the Society, in different parts of the country in rotation, original papers in every area of the Society's interests are presented by the industry's most active workers. Talks, films, and panel discussions present to the industry and to the public the newest advances and the newest problems. These are real forums, where manufacturer, engineer, ehibitor and technician can all learn and all contribute. Some of the industry's most startling discoveries have been first unveiled at these conventions so that attendance, or at least knowledge of what goes on there, has become over the decades, a must for forward-looking men wherever motion-picture film is used.

Scope

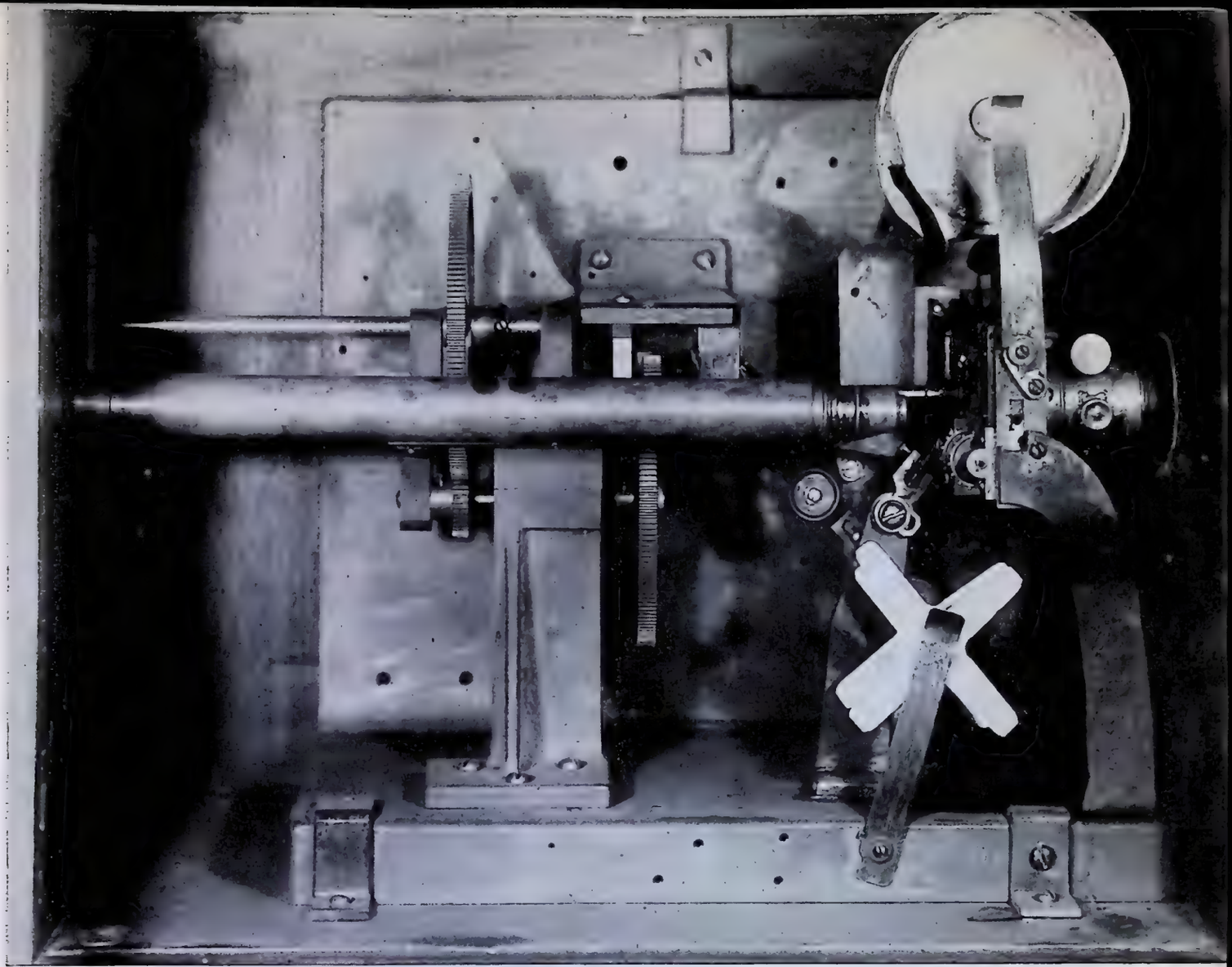
Anyone who follows the proceedings at SMPTE meetings, or who reads the published record in the Society's Journal, quickly finds out what problems are concerning the industry at any given time. The subject matter and frequency of occurrence are the best possible guide to the direction developments are taking, and to the prevailing interests among active industry people.

In 1953, for instance, a census was taken of members' preferences, and the detailed analysis may be read in the July 1953 *Journal*. A final collating of the answers to questions designed to show members' primary fields of interest produced the following list:

Sound Recording, Color, 16mm, Cinematography, New Products, Sound Re-



THE EARLIEST SUCCESSFUL motion picture apparatus to use strip film was Edison's Strip Kinetograph developed in the year of 1889.



INTERIOR AND EXTERIOR views of the bulky wooden box motion picture camera used in the "Black Maria" to take the first studio productions.

production, Optics, Processing, Lighting, Televison, Theatre TV, Production, High-Speed Photography, Projection, Acoustics, Editing, Animation, Films, Theatre, Education, and Stereoscopy.

This list just about covers the field and certainly gives a clear indication of the order of magnitude of the problems that are confronting the industry today. It also shows where present membership representation of the Society may be weak and where greater participation by those actively interested might be a help to even greater mutual contributions and benefit.

The varied interests of Society members are perhaps even more clearly shown by the variety of technical subjects handled by the engineering committees. There are committees on color, film dimensions, film-projection practice, high speed photography, laboratory practice, motion-picture studio lighting and process photography, optics, screen brightness, 16mm and 8mm motion pictures, sound, stereoscopic motion pictures, television, television studio lighting, and theatre television.

Achievements

The industry's economic success is a tribute to its leaders but the key to



THE FIRST MOTION pictures with sound resulted from Edison's 1895 Peephole Kinetoscope equipped with stethoscope-like tubes to hear the sound.

its early economic development is actually a technical one—the basic element of interchangeability. American railroads surpass the railroads of Europe primarily because our standardized rail gauges encouraged rapid nation-wide expansion—so do motion pictures owe their commercial success largely to the fact that critical dimensions of film, the industry's common denominator, were early standardized. As a result, films made in the United States perform properly on cameras in Italy, South Africa or India and films manufactured in foreign countries according to our standards fit projectors in America. Since the Society started out to help the industry put its house in order more than 80 standards have been established and published by the Society, with the cooperation of the Motion Picture Research Council. These standards have all been validated by the American Standards Association.

Herbert Barnett, President of the Society, has given some rather precise indications of what SMPTE considers to be its position: "The SMPTE never standardizes anything merely for the sake of standardizing. The Society recommends standards only when an analysis of the facts makes it evident that standardization will (a) result in important economies all along the line; (b) simplify and clarify operation; and (c) promote the interests of all instead of one or a few individuals and companies. . . . The day standards are employed to curb the initiative and pioneering spirit of exhibitors and producers, that day the motion picture will start on the downgrade to mediocrity and obscurity."

Technical matters of this kind are fundamental to future growth; they are the veins and arteries of America's supremacy in the motion-picture world and require that an international clearing house for cooperative engineering, one that is neutral but enthusiastic, continue to serve the technical interests of the industry. The SMPTE has done this job with competence for 38 years.

Creative Plus Cooperative

Manufacturers of film equipment maintain basic research and engineering laboratories to deal with specialized problems of their own products. Similarly, major studios maintain engineering departments which make efficient application of materials and equipment they buy, and develop new techniques and tools as a solution to local problems. The SMPTE does not duplicate this work but instead serves to correlate the work of such companies and studios to the best advantage of all. This ethical exchange of ideas, plans, suggestions and criticisms, shared by all who are interested, accrues to the benefit of exhibitor, producer and manufacturer alike. Engineering standards, committee reports and recommended practices which result from the work are dividends which mean lower production costs, more efficient distribution and greater profits to all.

Engineering in other industries is closely allied to fundamental research and the development of new basic concepts, with projects expensive to conduct and uncertain of outcome undertaken regularly in a continuing effort to produce new products or improve old ones. But motion-picture engineering is different. This is, technically, an application industry, one that has for a period of many years found specialized uses for tools and ideas developed initially elsewhere. The arts and sciences closely allied have been the hunting ground from which came many a motion-picture technical improvement. Because it did not have to support an extensive research program and because the coordination provided by the Society was not only effective, but particularly efficient, the industry has been able to prosper by investing only modest amounts directly in engineering projects. So long as business was good there appeared no incentive to do otherwise. There was no reason to alter the economy that gave large short-term returns on investment.

Increased competition from newer entertainment media together with other factors not surely known have begun to change this picture. Engineering is receiving greater attention. More vigorous efforts than ever before are being made to find and to apply developments currently available from outside the industry. But the use, at second hand, of the products of research sponsored by other industries is a custom that must eventually give way and even now appears to be yielding ever so slightly to a new policy of direct investment in technical research, specifically and exclusively for motion pictures.

Such a change has long been in the minds of the engineers who *are* the Society. Its appearance in fact will be

most welcome. If the Society has been of service in the past, it will be most vitally essential in the future.

Planned Engineering

The tools and techniques that motion pictures have used to become such a potent force today are the direct product of planned engineering, and many related fields of applied science have given the industry contributions of methods and materials. This has been done to their own mutual benefit by sharing in the planned engineering work of the SMPTE. The several phases of this work within the Society are related in one important respect—industry need. That the needs of the industry are adequately served is a foregone conclusion since the Society's membership includes technical men representing the joint engineering judgment of nearly every theatre circuit, studio and manufacturer. The broad scope of its 15 technical committees and this representative cross section of engineering talent when combined under the Society's direction provide a substantial safeguard for the current and future engineering needs of motion pictures.

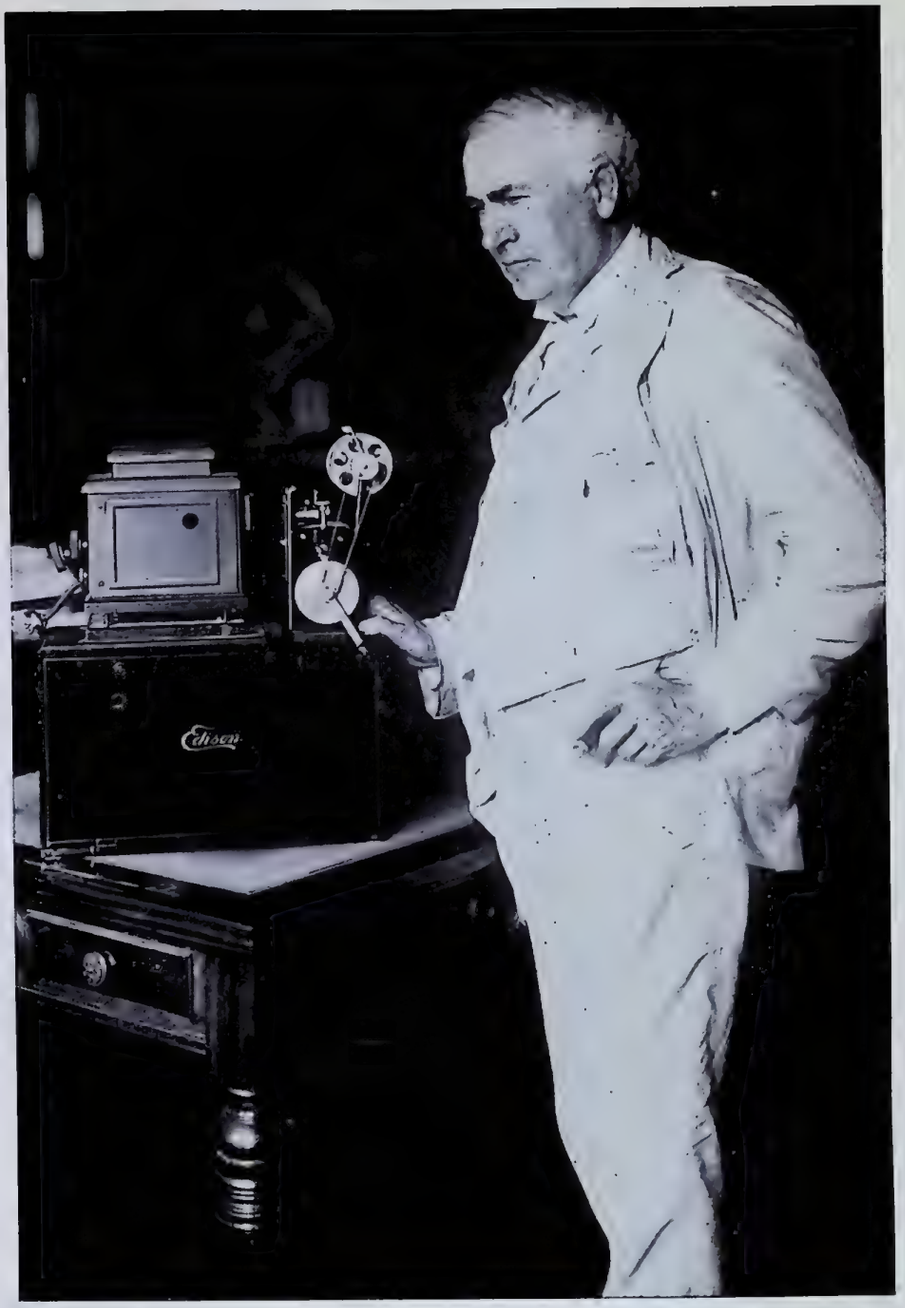
One phase of the Society's current work has to do with the use of television in conjunction with the theatre presentation of entertainment. Another has to do with progressive changes in basic film standards that will permit the production of color films at lowered cost. A third is associated with the application of magnetic recording as a new tool of production, and yet another concerns the film requirements of television that will enable the motion-picture industry to make the most of this potential market should it desire to do so.

Film

Most fundamental of the formal motion-picture standards are those on dimensions of film. Without agreement on film sizes, achieved among manufacturers and users through Society channels, wide distribution of prints would be impossible. Recently, introduction of new color processes was upset by certain relationships between present negative and positive sprocket holes. The Society was asked to coordinate alternate new proposals for an additional standard aiming at developing one set of film dimensions that would satisfy all users.

The Film Dimensions Committee has worked on these matters over the past two or three years; the standard for 35mm positive film has been brought up to date, and an alternate standard for either negative or positive film established.

At the present time this committee is busy developing standard dimensions for CinemaScope film that will determine the size and location of the perforations. Work is also being done to establish standards for projector aperture size and for the size and location of the magnetic soundtracks. General standard instructions for the use and handling of CinemaScope film are also in preparation.



WOOD HAD given place to metal in Edison's better engineered home movie projector of 1912.

The substitution of safety-base for nitrate-base film has long been a long-sought goal of the industry. Important in this connection is the determination of what constitutes a safety base film. The Society participated in work leading to the establishment of a standard definition of safety film. This standard is now in the process of revision to bring it up to date.

A very practical step has been the development by the Society of a standard threading leader that can be used by both the fillm and television industries. This leader is now distributed by the Society itself.

Color

Conversion to more extensive use of motion-picture color processes, some of them substantially different from those of the past, has introduced a multitude of new problems. Most critical factor is the lack of detailed knowledge about use of color materials among technical people in film processing laboratories, whose experience has been largely with black-and-white films. To help them learn the practical language of this complex art and to understand the characteristics which demand more precise control than has been customary, the Color Committee in 1950 prepared a 72-page text on Principles of Color Sensitometry. Every Society member received a copy as part of the *Journal* and 2,000 additional copies separately bound have been distributed.

Not long ago this committee was asked to work on a standard for determining the apparent color of the light reaching a motion-picture audience when there is no film in the projector gate. Deviations here can greatly affect the balance of projected color prints and the establishment of a standard can be expected to help improve the average level of quality in the projection of color films.



"THE RECORD OF A SNEEZE" was one of the first films made by Edison. Outcault's published sketch (1894) shows the method of the shooting.

The Color Committee is at present preparing a brochure intended to help studios at every step in the making of color motion-picture films, from the lighting and arrangement of sets to the laboratory processing of the film, even including detailed advice on make-up, dress, etc.

Sound

Improvements in magnetic recording and the trend toward its wider use have been occupying a great deal of Society attention over the past few years. Two standards already have been established and more are being developed. Several magnetic test films have been produced and are being distributed by the Society and further work is being done along these lines.

Research and experiment in stereophonic sound principles and techniques has been very active, and large quantities of published work on the subject is to be found in the *Journal*. The September 1953 issue carried a special supplement devoted solely to this subject.

Television

Lighting requirements in television studios differ from those of the motion-picture studio; however, since the desired end results are similar and the equipment used is often identical, the Society has been asked repeatedly to provide some help from among its members for orientation of broadcasters. The discussions of desirable practices, held at several national conventions, plus wide distribution of recommendations presented there, have begun to lay ground work for future contributions by the Television Studio Lighting Committee.

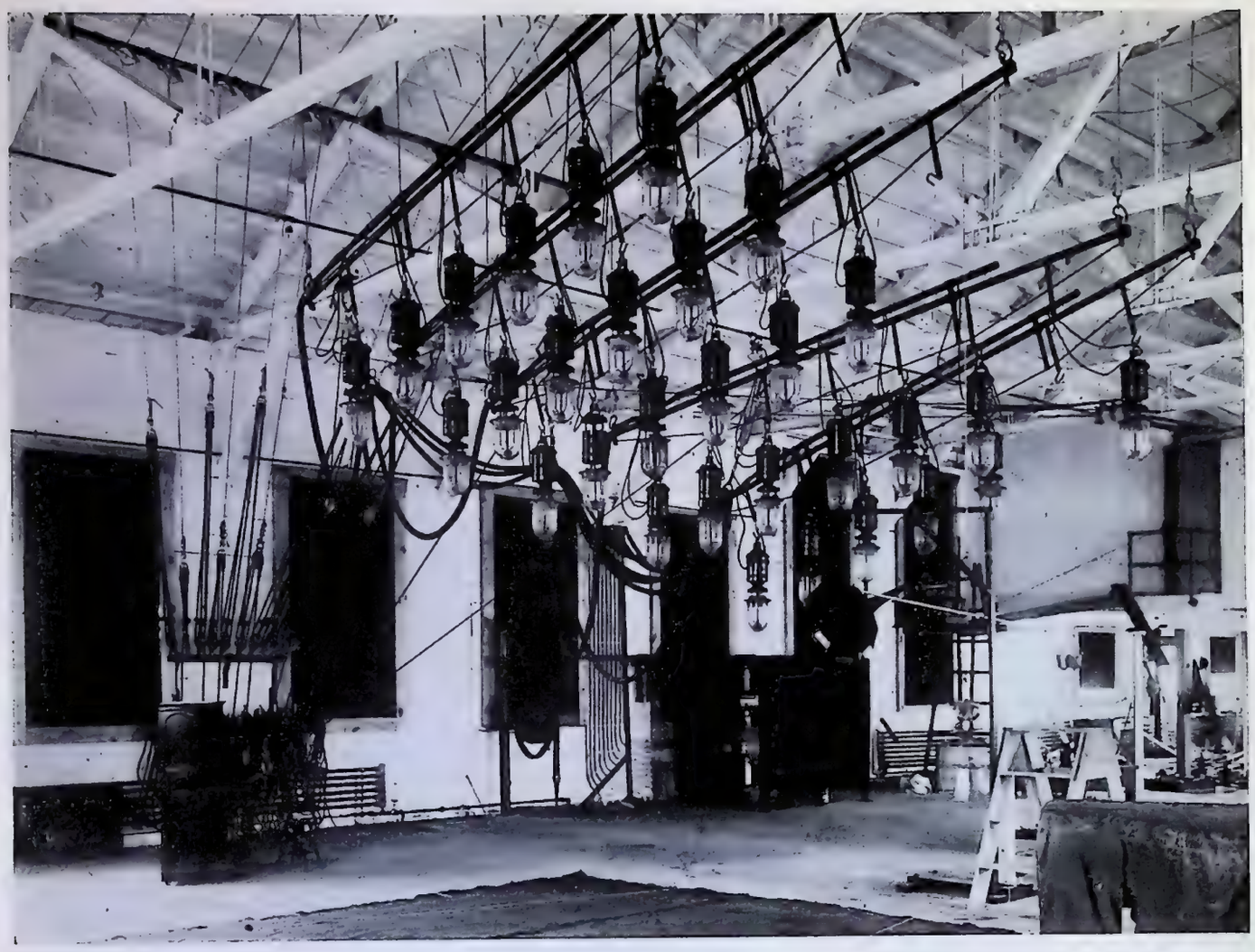
Consistent practices in use of films as a reliable source of program material are now beginning to evolve. They are based largely on a television test film developed by the Society with the aid of several broadcasters, whose experience was somewhat broader than average. Prints in use by nearly every television studio help insure that a properly made motion picture will utilize, to the limit, potentialities of the film-camera chain. Serious attempts at defining a "properly made film" which proceeded concurrently with work on the test reel produced "Films in Television," a report of the Television Film Committee. A second generation definition was later published commercially. A third contribution following hard on the heels of the first two appeared in the form of a very competent and lucid specification for films to be broadcast. Written by an individual member, it was first published in the Society's *Journal* for August 1950, and two subsequent printings have failed to supply the demand for copies—indicating the serious interest in quality improvement on the part of both film makers and the television industry.

Theatre television is a field in which the Society feels a closely related interest with its other theatre activities. After actively sharing in the presentation of the industry's case before the FCC for theatre television frequencies the Theatre Television Committee has worked on many practical recommendations which have enabled the industry to go into production on suitable equipment.

High-Speed Photography

The detailed study of fast-moving objects is one area where motion-picture photography becomes a real research tool. Cameras of incredible speed, capable of taking pictures up to 100,000 frames/sec and more, can photograph shock waves or combustion processes, study the movement of guided missiles or projectiles in free flight, or examine





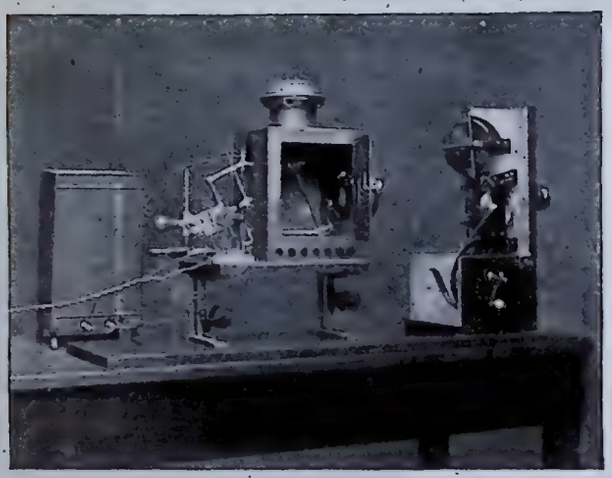
ABOVE: SOUND STAGES and studio equipment of the pioneering days are indicated by this view of Edison's laboratory for the making of KINETOPHONE pictures. Note the suspended recording phonograph that was used to pick up the sound accompaniment. Below: A forerunner of the nickelodeon was the first Kinetoscope Parlor which was opened April 14, 1894 at 1155 Broadway in New York. Patrons wandered in and out at will.



EDISON $100

PROJECTING KINETOSCOPE '97 MODEL

Is the latest product of the *Edison Laboratory*, and embodies many great improvements over any other *Life Picture Projecting* Machine yet placed on the market



THIRTEEN ESSENTIAL FEATURES

Steadiness. Vibration overcome by improved steadying device.
No Flickering. A brilliant light without any unpleasant flickering.
Hand Motive Power, which can always be relied upon.
Economy. A mechanism which has no striker to injure films.
Light. Independence of electricity; a calcium burner can easily be attached.
Large Picture. It projects a picture even greater than life size if desired.
Portability. Weighs, complete, about sixty-five pounds. Easily packed in ordinary trunk.
Simplicity. Only one operator is necessary, other machines require two.
Clearness. Objectionable perpendicular rays entirely eliminated.
Adaptability. Is equipped for all electric currents, with spool-banks and reels, and can be placed on ordinary table or stand.
Framing Device is without an equal, its adjustment instantaneous.
Dimensions. When set up, length, 3½ feet; width, 11 inches; height, 2 feet.
Cheapness. It is the *best* and by far the *cheapest* projecting machine on the market.

Standard Edison, International, and Foreign Films

In 50 and 150-foot lengths Over 250 Startling and Interesting Film Subjects to Select from

THE 1897 MODEL KINETOSCOPE is pictured and described in this trade advertisement sold for the handsome price of $100. Copy is worth reading.

mechanisms operating at high speed. Limited information about equipment of photographic techniques for such specialized applications used to be a serious obstacle to progress on important research projects, and a great deal of effort in recent years has gone into the refinement of this particular branch of the art.

The Society's first contribution was the prompt publication in the SMPTE *Journal* of all valuable technical material on the subject gathered by the High-Speed Photography Committtee. From time to time all this material is reprinted in a convenient collection. The most recent of these, *High-Speed Photography, Vol. 5*, was published in June of this year and includes material that appeared in the *Journal* during the past year. An indication of the degree of importance attaching to the field and its prominence among subject matter featured in the *Journal* is the fact that this latest in the series is an ample-sized book of 359 pages.

The Society also promoted a survey of equipment and methods used in 100 research laboratories through the country, with emphasis on needs unfilled by the tools either then at hand or known to be available. Publication of the results has served as a guide to future improvements or research into the field of high-speed photography.

Theatres

Effectiveness of a motion picture depends on technical details of projection and on viewing conditions in the theatre. Consequently, both factors receive an important share of the Society's attention, with the practical result that the industry's effortn to improve auditoriums for better viewing are properly related to parallel efforts directed toward bright pictures, larger screens, more color and improved print films. The combined effort is of substantial aid to the exhibitors.

A Screen Brightness Survey in 1948 proved that many theatres got less light than they paid for because tools for alignment of projector optical parts were not generally available to projectionists. Independent work on improved light sources was stimulated by the indicated need for more light and regular theatre projection maintenance programs were encouraged. In addition, need for quicker, accurate light measurements prompted development of a new screen brightness meter used on an enlarged survey of projection conditions in more than 100 theatres. Each manager received a complete report on projection conditions in his own theatre. When all data had been collected, a complete tabulation, in which each theatre's identity remained undisclosed, was published with critical comments by the Screen Brightness Committee.

Currently the Screen Brightness Committee is conducting a new survey of projection conditions in drive-in theatres —thus far an area where no screen brightness standard has yet been set. It is expected that the survey will supply the data for the establishment of such a standard.

In both indoor theatres and drive-ins the Committee is investigating the effects of stray light and unevenness of light

distribution on the quality of the projected image with a view toward improving existing or future screen brightness standards.

Exhibitors who are interested in a high level of technical efficiency are able to compare performance in their own theatres with the norm and with the Society's recommendations. Producers can learn in detail how their films are being shown; film laboratories now have up-to-date information on current viewing conditions that should have value in the preparation of release prints; equipment manufacturers can learn more than they now know about actual performance of their equipment in service.

Another of the engineering committees having to do with the theatre matter, the Film Projection Practice Committee, is improving the standard which determines the height at which the projector lens should be set, measured from the projection-room floor. The same standard also prescribes focal lengths and focal markings for projector lenses.

Test Films

A very comprehensive selection of test films is put out by the Society in collaboration with the Motion Picture Research Council. In design, test films are the yardsticks for setting performance objectives of new equipment. In production they are standard tools of inspection. As a uniform source of film signal for lining up the film pickup system, they aid in proper mechanical adjustment of the projector and its sound reproducer mechanism.

There are films that tell what is wrong when the projector or sound system is not operating correctly. Others are for use after repairs, while adjustments are being made, and indicate when performance is again within specifications. There are test films with picture and sound, of typical release print quality, that make individual or comparative demonstrations of projectors meaningful.

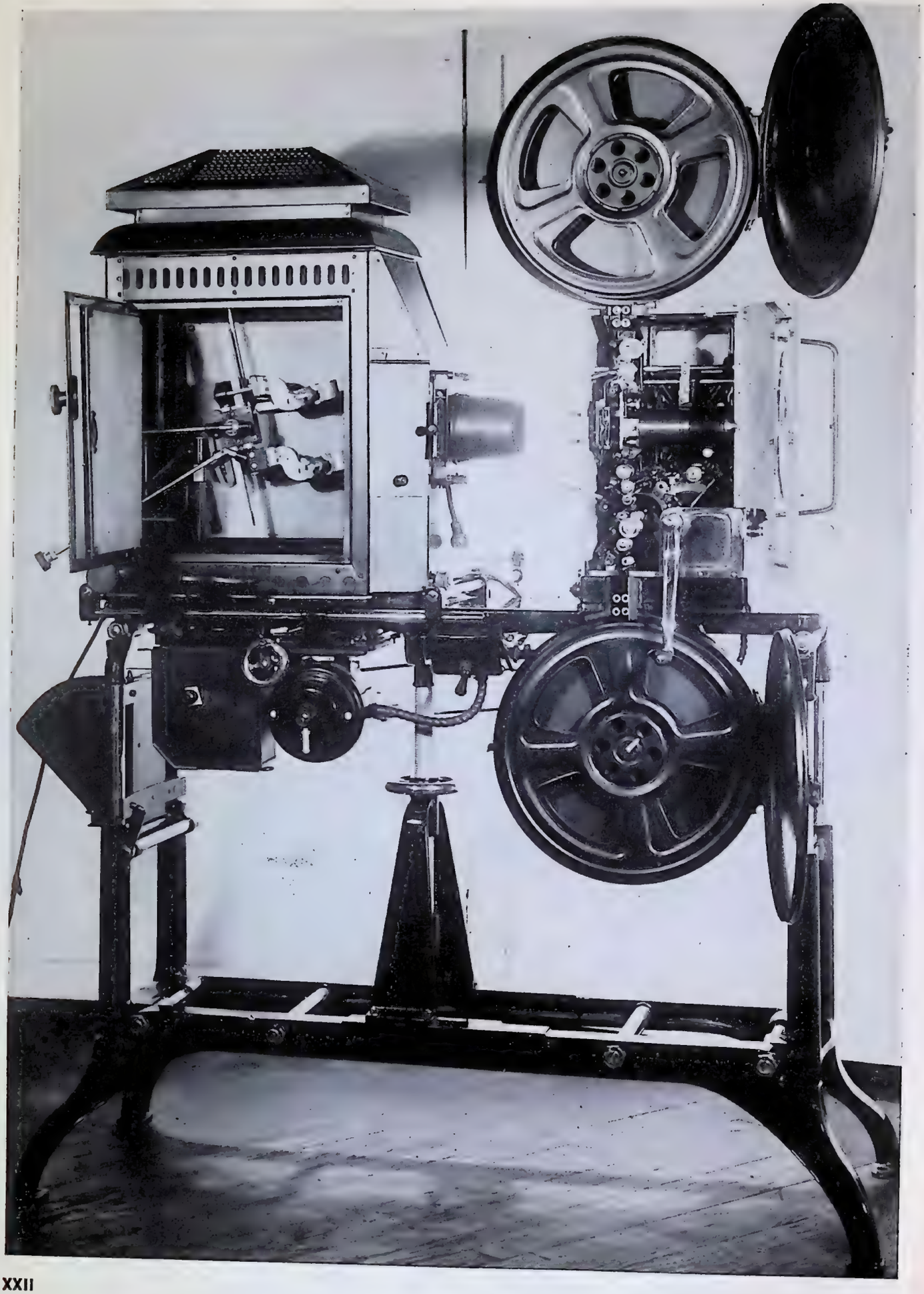
Recently the Society took over the distribution of test films for CinemaScope also. Included among the films available are: a level balance film used in adjusting all channels for equal volume, a multifrequency test film used for checking the frequency response of all four channels; a flutter test film accurately made to measure variations of the rate at which the film passes through the magnetic reproducer; a loudspeaker phasing test film which carries a warble frequency signal to check the phasing between the high-frequency and low-frequency speakers on channels one, two and three; constant level test film with an accurately placed 8000 cycles per second recording to check azimuth of the magnetic reproducer heads; a channel four test film consisting of a recording of 12,000 and 1000 cycle signals to adjust the automatic switching circuits on the channel four surround speakers; and a projector alignment test film containing picture only, used in adjusting the projector aperture plate, positioning of the anamorphic projection lens attachment, the alignment of one projection machine with the other and for positioning the black masking around the screen.

Work in Progress

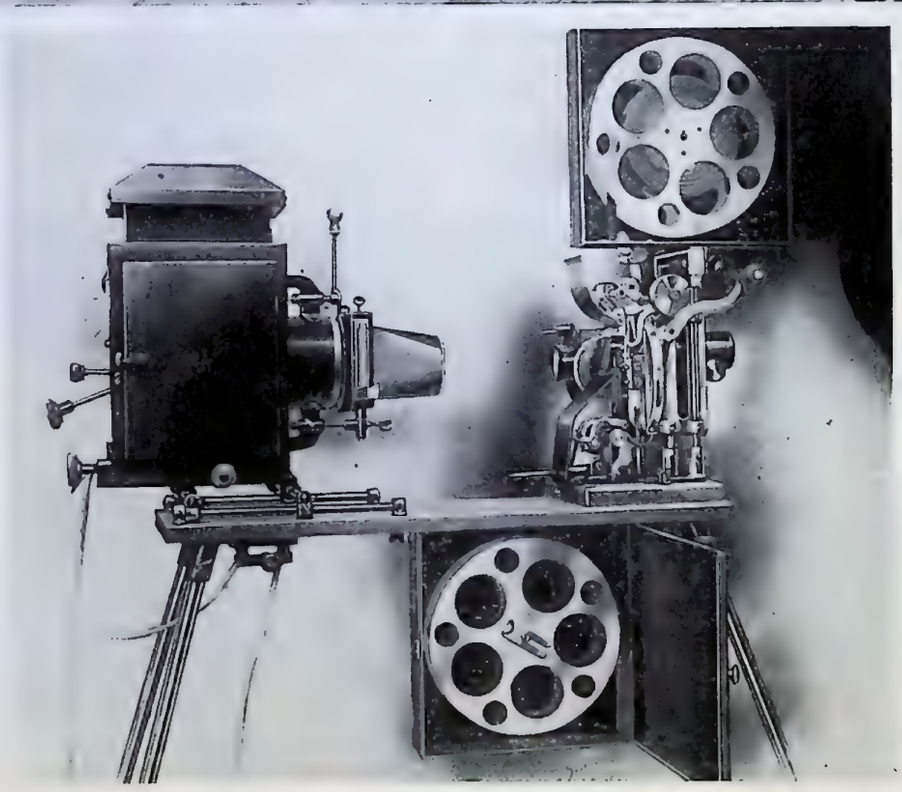
In the changing conditions of the last couple of years, and faced by new and unprecedented competition in the entertainment field, the motion-picture business has been stirring itself as it has rarely been stirred since the pioneer days. New color systems, new lighting methods aiming at a more satisfying projected picture in conventional theatres and in the new drive-ins, wide-screen techniques and 3-D have all been the subject of vigorous experimentation, with varying degrees of success. The distinguishing feature of most of these efforts has been their dependence on long-established principles and standards. Research engineers have delved back into the archives, come up with promising lines of inquiry from the remote past of the industry, and set to work to develop them to meet the needs of the present.



SCENE FROM A TYPICAL KINETOPHONE sound production. This one was "After College Days."



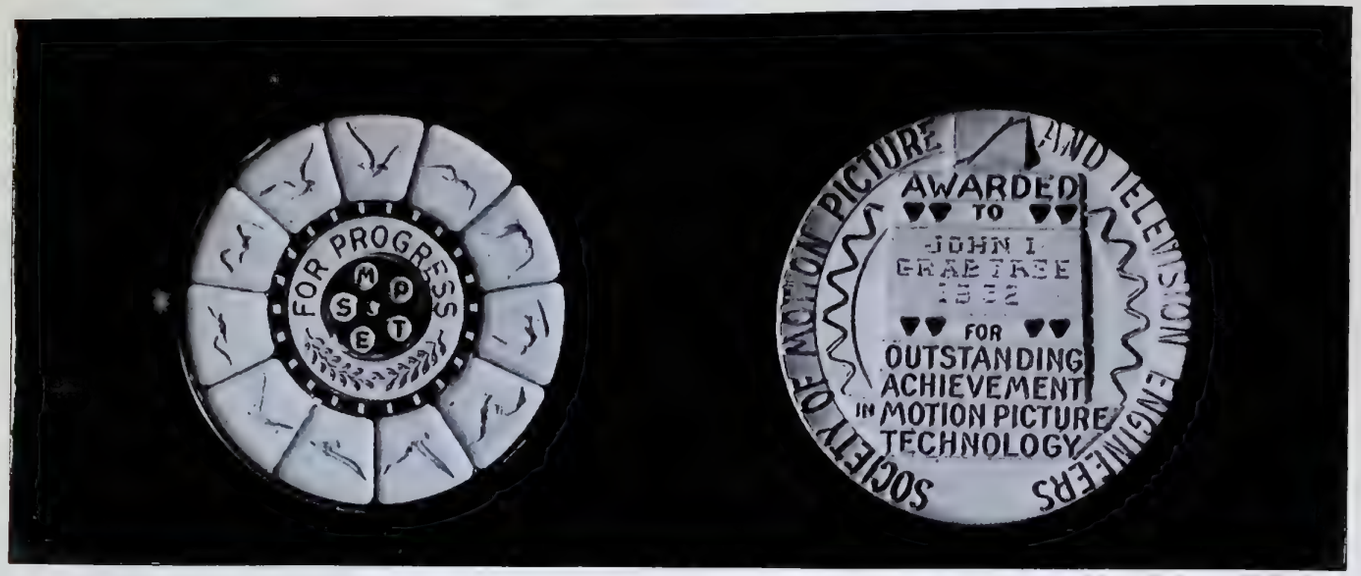
OPPOSITE page: Edison's Super Kinetoscope for theatres (1914). Above: In 1913 talking pictures were shown in theatres with Edison's Kinetophone. Below: A Nicholas power projector of 1903.



Stereoscopy is an obvious example. The stereoscope of the last century gave the clue even to the earliest film-makers as to what might be done to make their pictures more life-like. The search for a method that would give the viewer a three-dimensional impression without the impediment of polarizing glasses has been going on for decades. Cinerama can look back for its parentage to the cyclorama theatre in Paris years ago, where projectors showed a continuous picture on a completely circular screen inside which the audience sat. It was in no other place than the early *Transactions* of the Society that 20th Century-Fox engineers found descriptions of the anamorphic lens that has now become the basis of CinemaScope.

More recently still, an important change has been taking place. Growing bolder in their search for more ways to improve their product and retain their markets, the industry's engineers have gone beyond the adapting of established techniques and will soon provide the industry with developments that are entirely new.

DISTINGUISHED AWARDS OF THE S.M.P.T.E.





AS AN HONOR to those who have contributed most, and as an incentive to the younger creative minds, the Society of Motion Picture and Television Engineers annually presents its most coveted awards. Above: The Progress Medal Award for significant contributions to the advancement of motion picture technology. Next: The David Sarnoff Award for outstanding work in some technical phase of the broad field of television or in any similar phase of theatre television. Below: The Samuel L. Warner Award, for outstanding work in the field of sound motion picture engineering.





DR. JOHN G. FRAYNE, Engineering Manager, Westrex Corp., and Exec V. P. of S.M.P.T.E.



DR. NORTON L. SIMMONS, Eastman Kodak Co., Rochester, N. Y., and Editorial V. P. of S.M.P.T.E.



HERBERT BARNETT, Cinerama Corp., New York City, and the current President of S. M. P. T. E.

The Eidophor theatre television projector that has been demonstrated within the trade and the vectograph system of 3-D motion-picture release film printing and projection that has been announced as nearing commercialization are two examples of new technical developments now the object of interest to motion-picture businessmen. Both came to light, not dust-laden from the shelf, but freshly from the research laboratory. A third example which was demonstrated recently is a single-film, single-projector system of wide-screen motion pictures whose most notable characteristic is a unique optical system reported to spread the picture to the lateral limits of human vision.

Time will disclose the practical results of other laboratory work now being conducted, the general outlines of which can be surmised, but whose details are being closely guarded by their proprietors.

As each such new development matures into a machine or process or technique that appears to possess commercial value it becomes the subject of intense interest to motion-picture technical people. Partly because of its newness, but more because it is born into a family of long-established methods, it is of immediate concern to the motion-picture engineers who must work it into the current scheme of things.

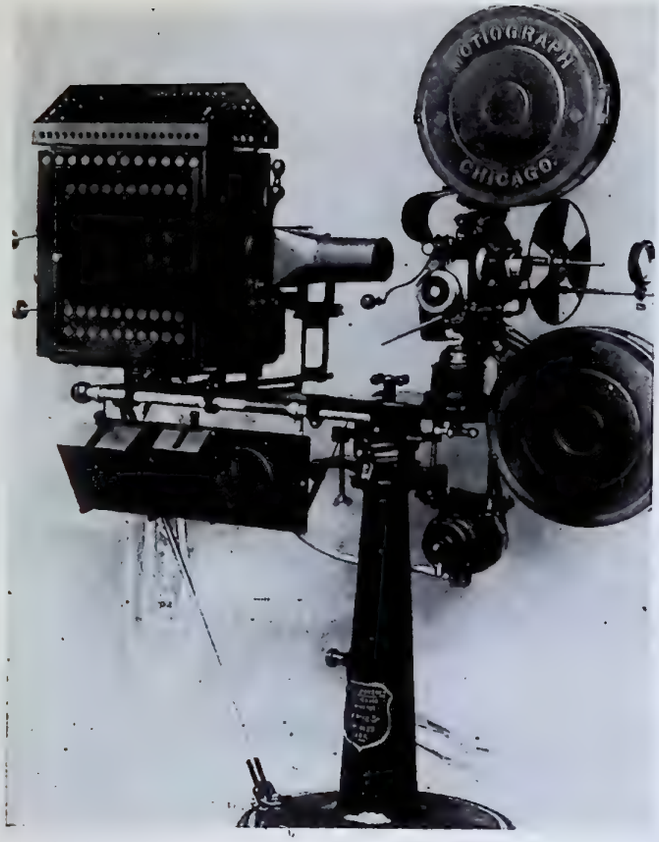
In the years to come, the engineering committees of the Society will be as attentive to new technical problems that arise as they have been to the standards and technical practice problems that appeared years ago at a regular yet modest rate and that cropped up in droves during the Second World War when the 16mm field needed and got a great deal of attention and during the last year and a half to two years when the big picture came along. Since the motion-picture is surely becoming more complex with each succeeding series of changes and improvements, so will the service which the motion-picture industry's technical people are called upon to provide through the SMPTE become more complex. Similarly we can safely assume that it will become more necessary and more valued. The trend is a particularly welcome one to the engineers who for many years have been preparing themselves for just such an opportunity.

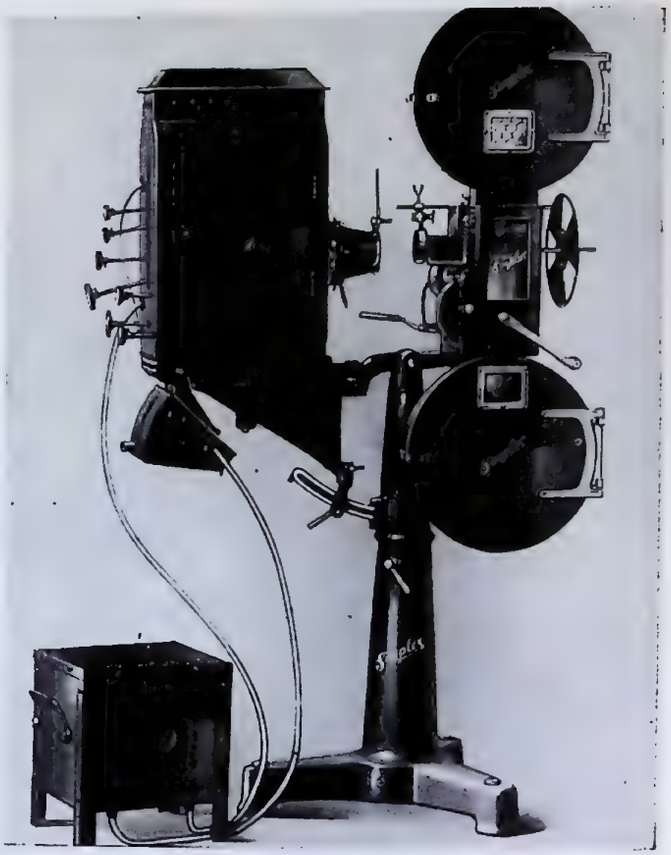


LEFT: BARTON KREUZER, Financial V. P.; Alex G. Jensen, Engineering V. P.; George W. Colburn, Treasurer. Below: S. Seeley, Secretary.

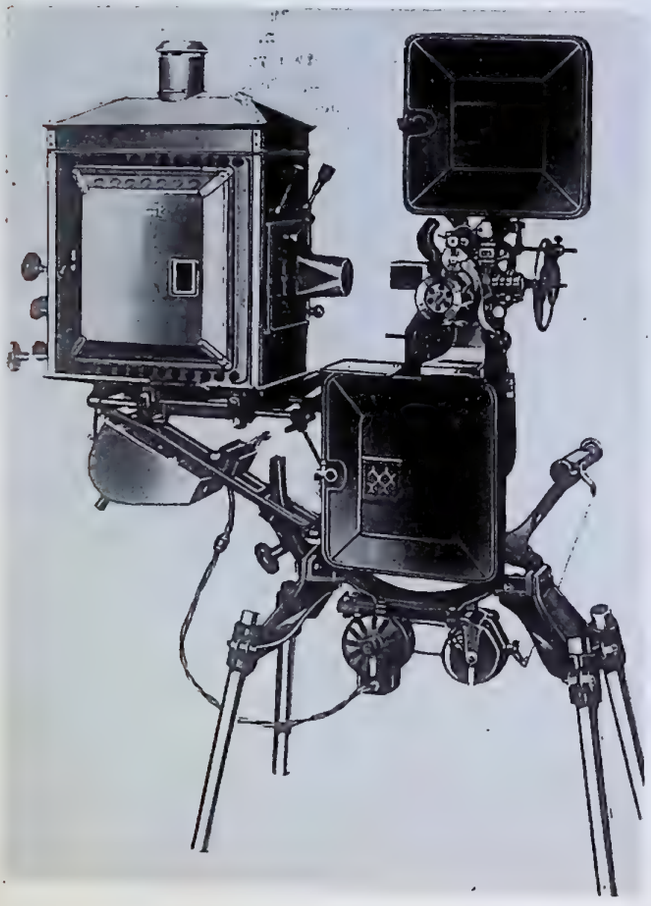


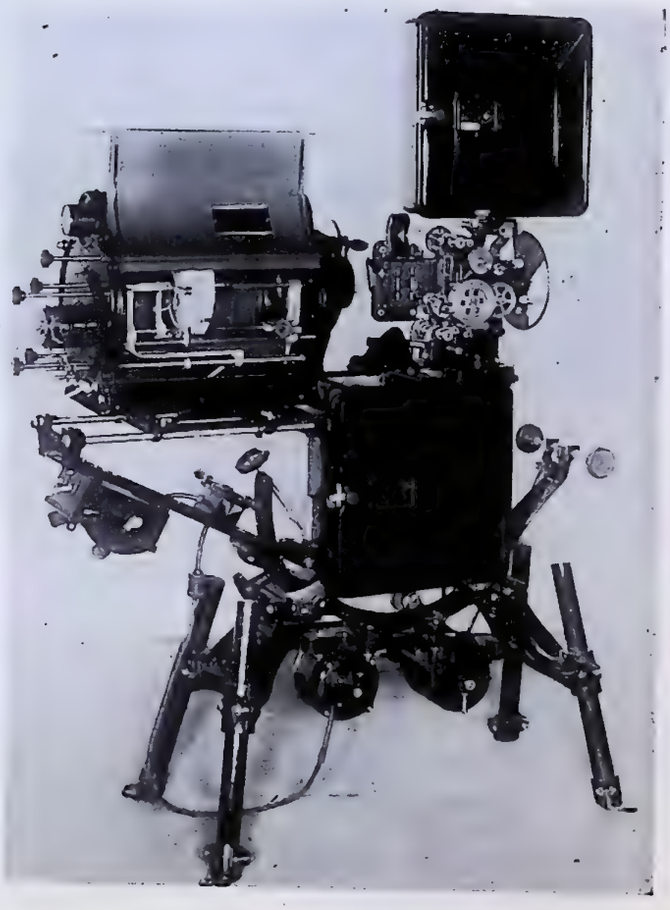
PROJECTION PROGRESS THROUGH THE YEARS

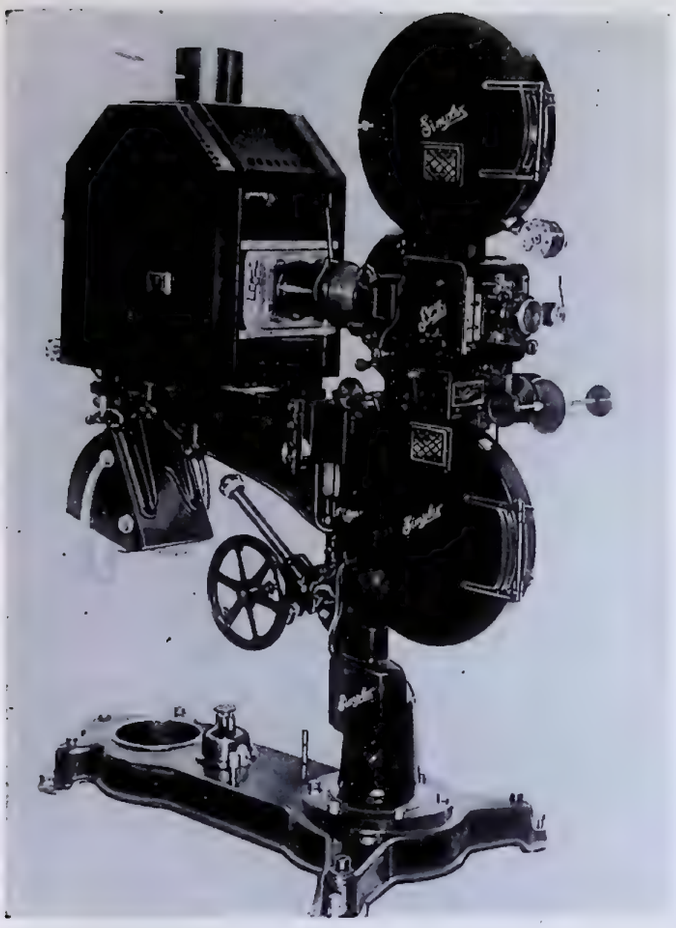


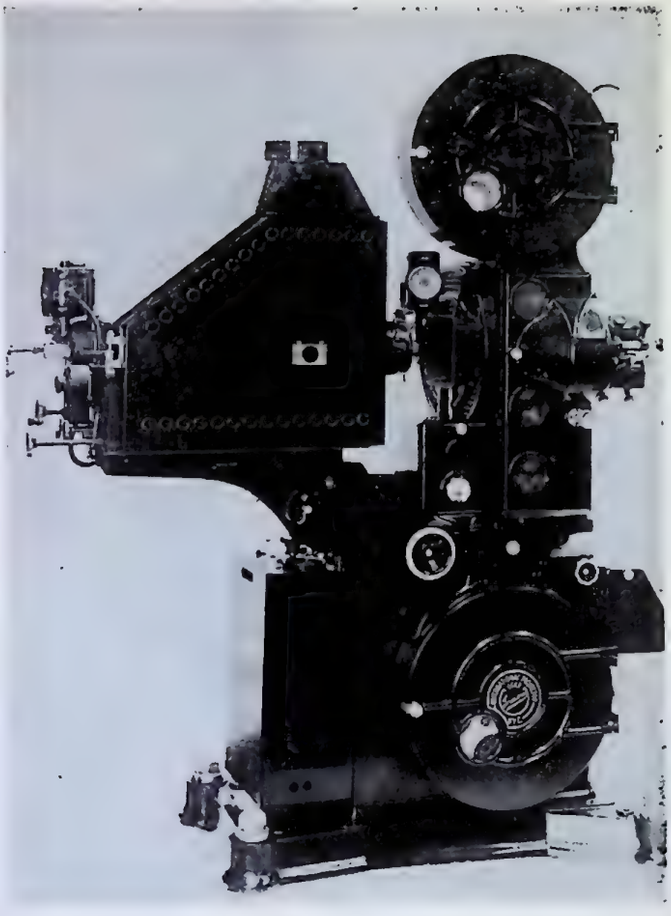


OLDEST OF THE PROJECTORS still serving the industry under its original name is the Motiograph. Pictured above left is a 1908 model 1-A. The original Simplex Projector of 1910, above right, was the first to have an enclosed operating side. The Nicholas power projector of 1915, below left, was the first to have a Power movement instead of the Geneva movement. A Nicholas Power projector of 1927, below right, shows the reflector arc lamp which was originally introduced in 1922 and did much to increase picture brightness. Note the speed control, seen at bottom of the mounting.

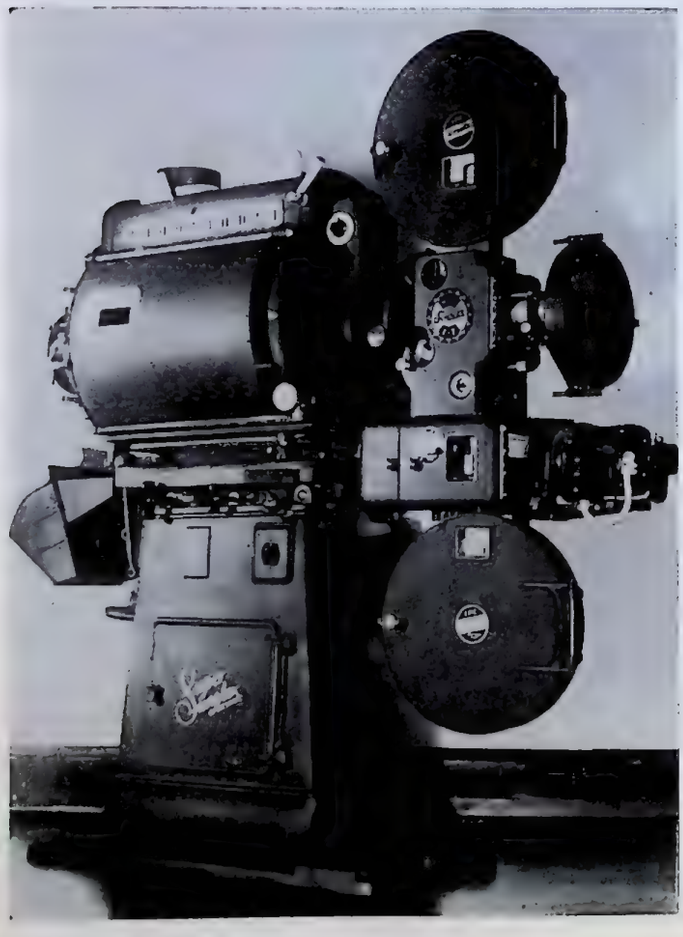


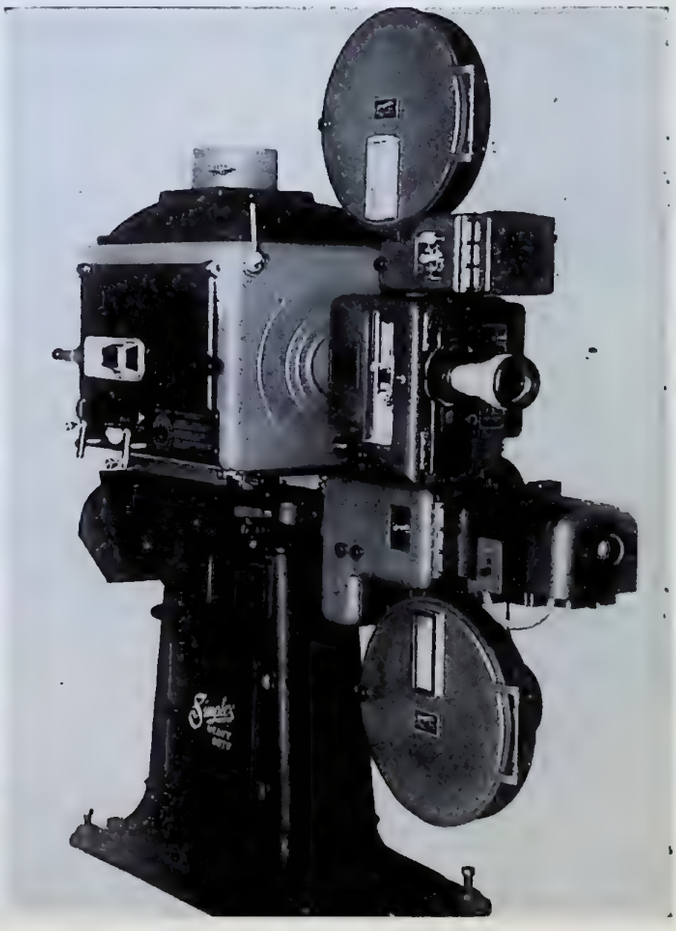


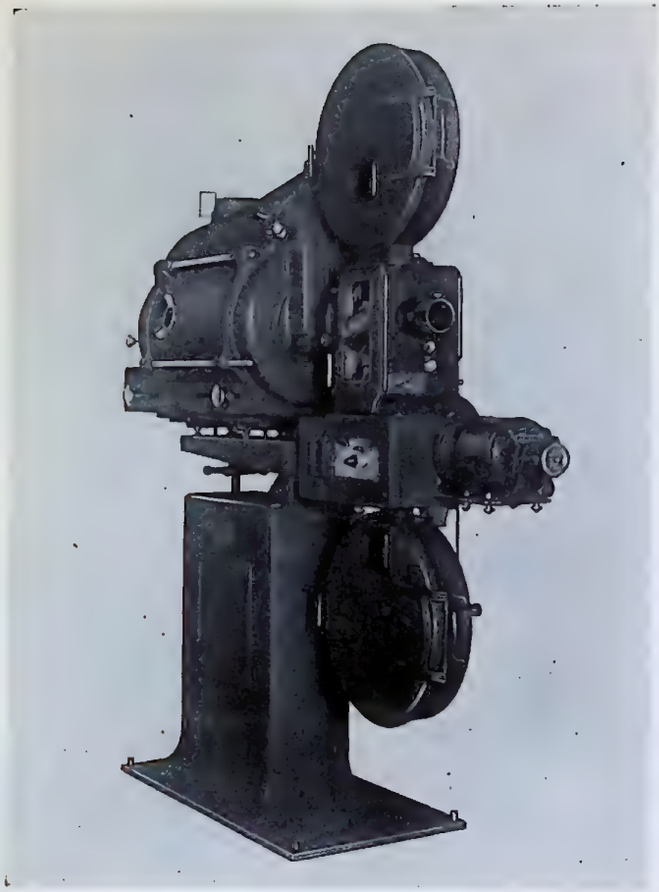


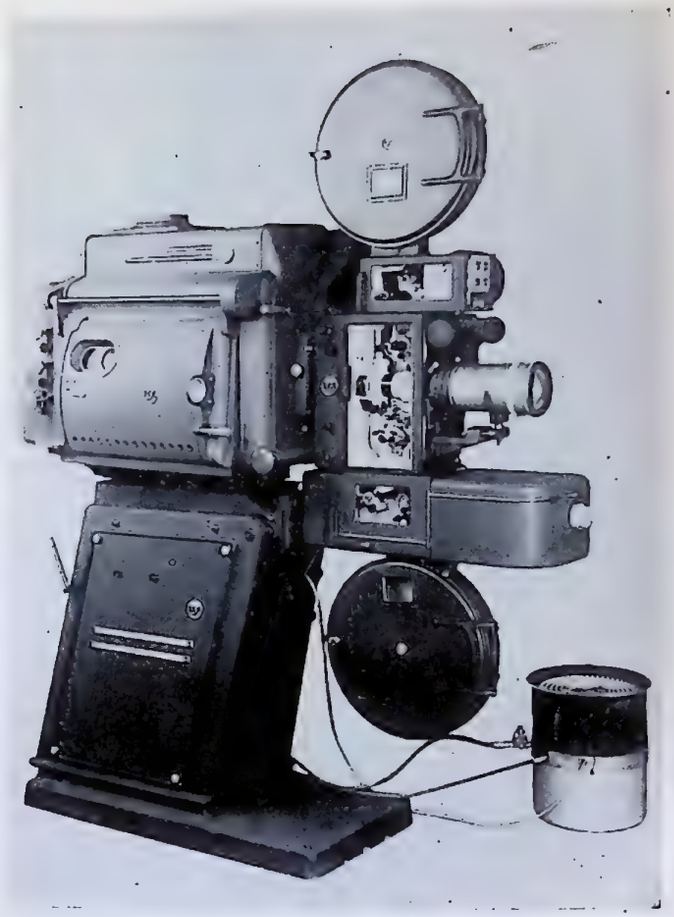


THE MODERN SOUND PROJECTOR as we know it today naturally evolved most closely from the last of the silent ones here typified, above left, by the Super Simplex of 1929. The Grandeur projector, above right, was the first to combine picture and sound heads and could play both sound on film and disc. The seven manufactured could accommodate 35mm film for regular screen sizes of 70mm film for the so-called Grandeur Screen that was double regular size. Below left, is the advanced model Simplex E-7, and below right the Simplex X-L equipped for CinemaScope and sound.

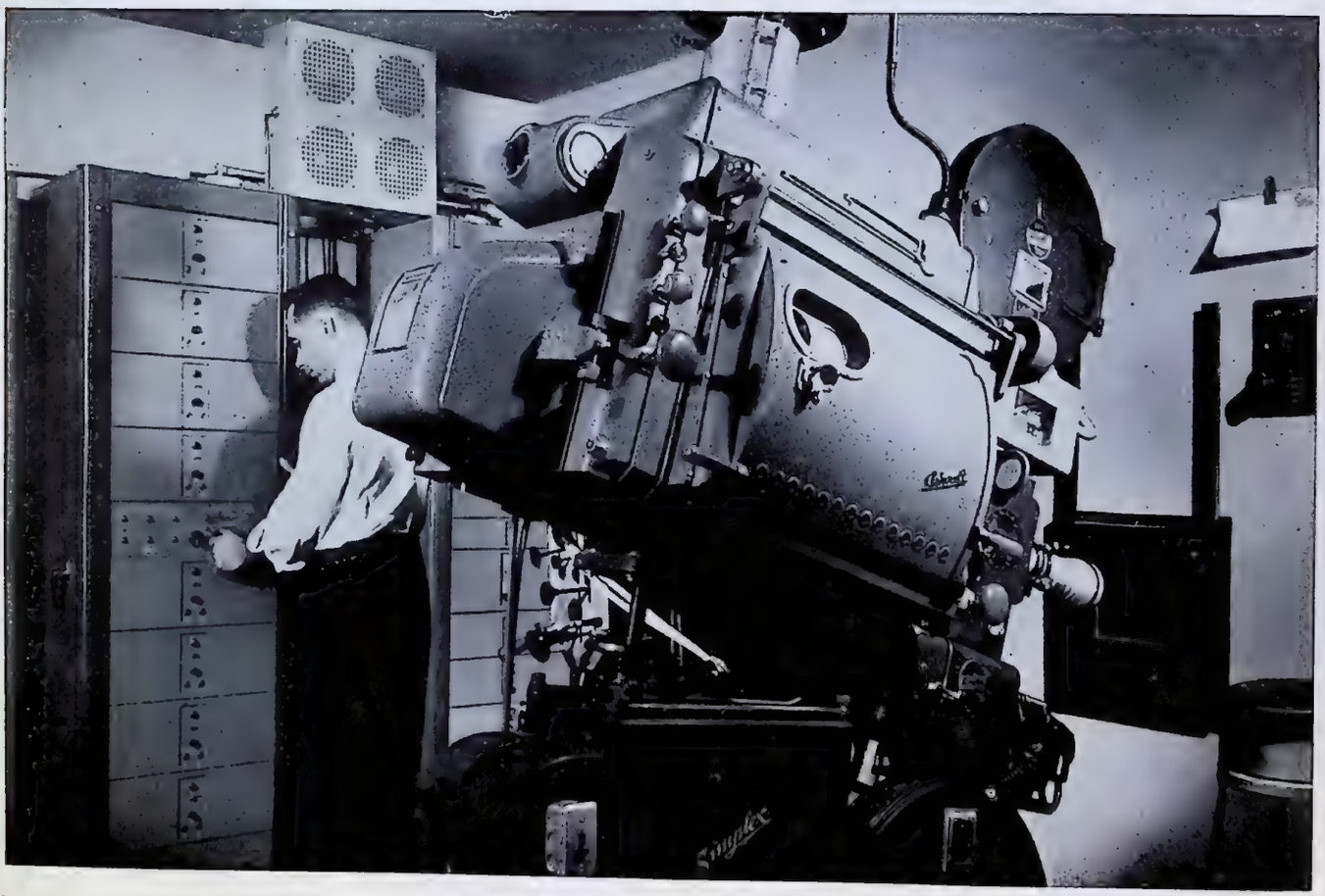


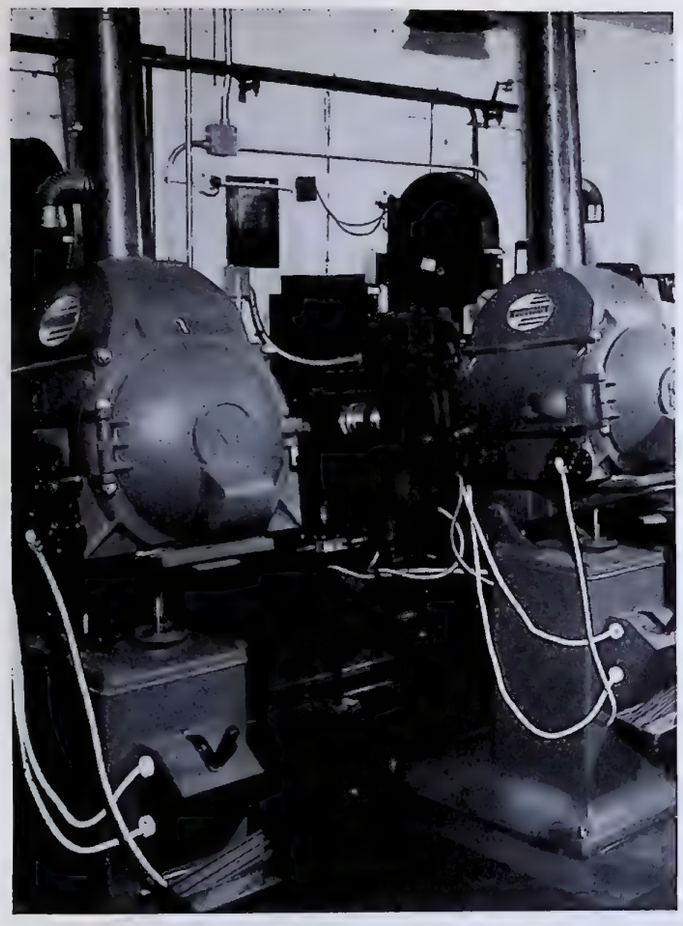


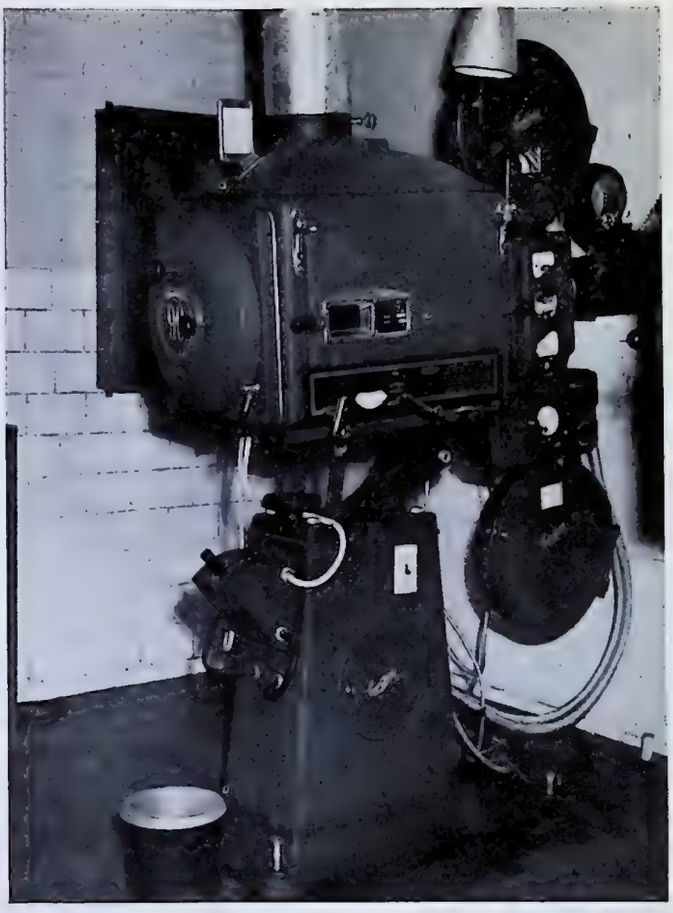




WHEN THE INDUSTRY underwent its recent technical revolution it was the duty of the projection and sound manufacturers to produce the necessary equipment and designed so that it would require a minimum amount of change in the booth. Two examples of today's modern projectors, equipped for CinemaScope, are the Ballantyne, above, left, and the RCA, above, right. The booth of the Fox, San Jose, Calif., is equipped for stereophonic sound.





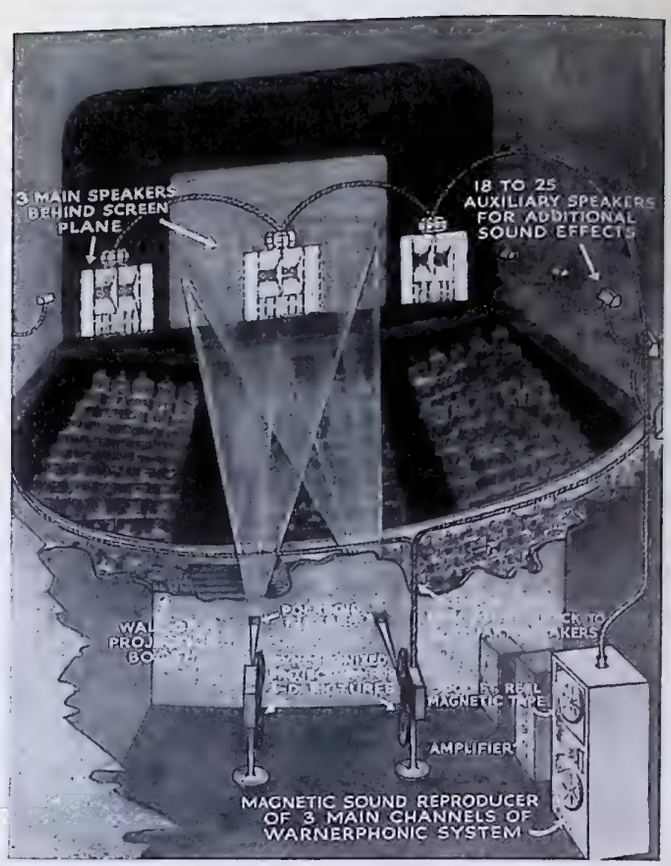


THE BOOTH OF THE FAIRMOUNT, Cleveland, O., above, left, has two late model Motiograph projectors equipped with CinemaScope lenses. Century Projector, like the other manufacurers, is producing a fine machine, above, right, to show the best of the new systems in the proper manner. Because of its role the drive-ins could not be excluded, and the RCA equipped booth of the Belmont Auto Drive-In, Dayton, O., below, proves they haven't.

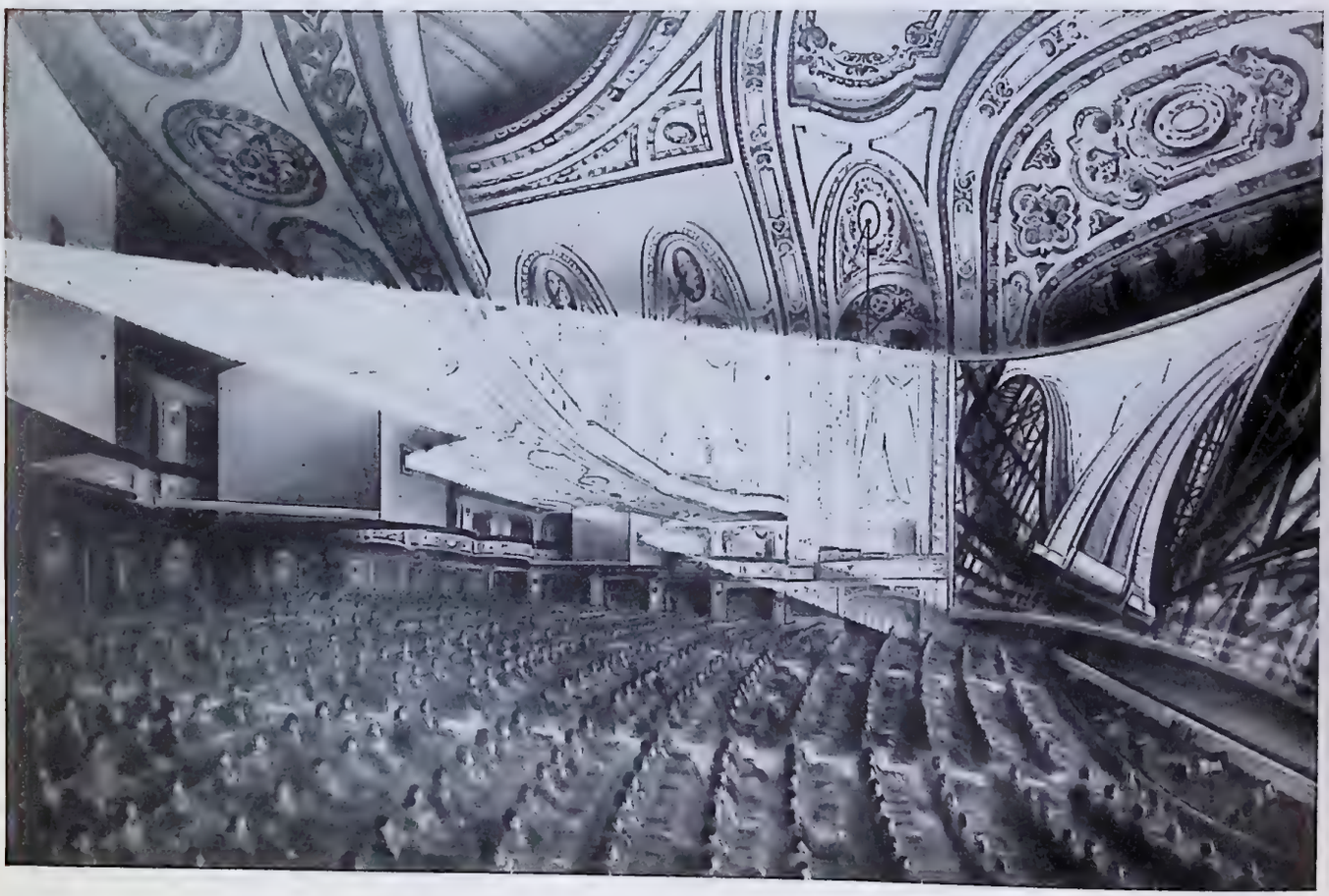


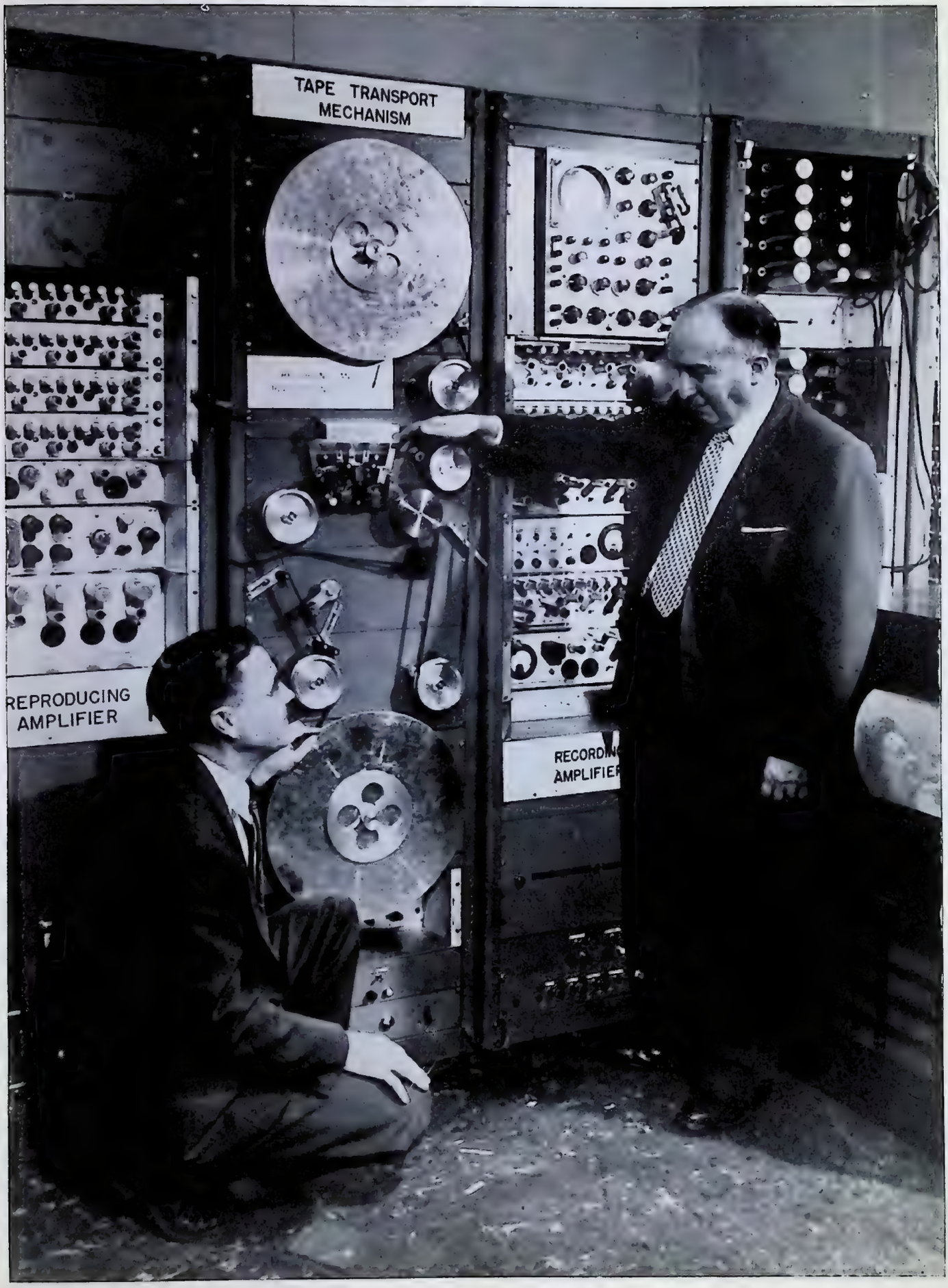
DEVELOPMENTS OF THE CURRENT AND FUTURE





THE FUTURE HOLDS MANY exciting things in store. Theatre television, above, left, is sure to play an important role. The combining of wide screen, 3-D, and stereophonic sound, above, right, may be another important development. Already a huge success Cinerama, below, should improve.

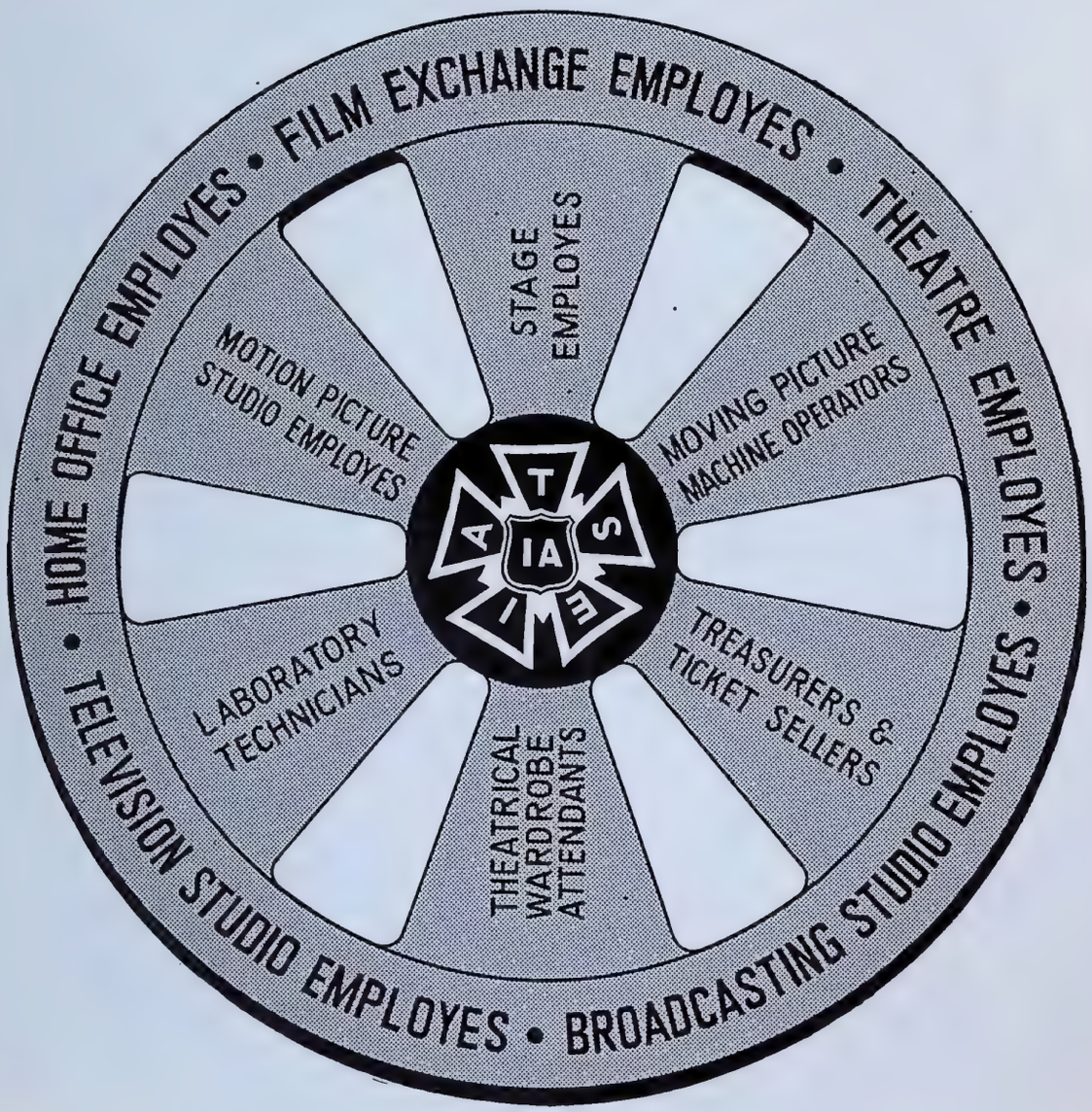




THIS RCA EQUIPMENT to transmit sound and pictures on magnetic tape, holds out promise for wonderful and exciting developments in the future.

International Alliance of Theatrical Stage Employes and Moving Picture Machine Operators of the United States and Canada

Affiliated with the American Federation of Labor



RICHARD F. WALSH
International President

HARLAND HOLMDEN
General Secretary - Treasurer

Suite 1900
1270 Avenue of the Americas
NEW YORK 20, N. Y.

BOOK ONE:

Design and Construction

Design

THE CENTRE: A SYMBOL OF PROGRESS 2
Constructed at a Cost of $1,000,000, Denver's Centre Theatre Represents the Finest in Modern Theatre Design and Operation

WORLD THEATRE SURVEY 6
Study of New Theatre Construction and General Conditions Currently Found in Various Countries Throughout the World

THEATRE CONSTRUCTION IN JAPAN....*Michiro Tomono* 20
A Complete Survey of the Motion Picture Theatre Construction Activities and General Industry Conditions in Post-War Japan

THE CINEMA: A MODEL THEATRE 32
Small Canadian Town Can Boast of Its New Theatre Equipped to Show All of the Latest Projection and Sound Techniques

Construction and Materials

PLYWOOD GOES TO THE THEATRE.....*Robert E. Eskew* 36
Review of the Many Uses to Which the Versatile Plywood Material May Be Adapted In Indoor and Outdoor Theatres

PAINT FIRE HAZARDS AWAY.....*A. Sophir* 41
A Discussion of Some Common Causes of Theatre Fires and How Fire Retardant Paints Can Lessen the Danger

ORIENTAL MOVIE PALACE.....*Chien Sing Shou* 44
A Thorough Description of the Equipment and Design of the Hoover Theatre in Hong Kong, One of the Orient's Finest, Newest Theatres

1953-54 REVIEW OF THEATRE CONSTRUCTION 48
CARIB, Clearwater, Fla. 49
MONTROSE, Montreal, Quebec, Canada 52
MAJESTIC, Hebron, Nebr. 54
CINE TROPICAL, Acapulco, Mexico 56
FILM CENTRE, Baltimore, Md. 59
CARSON, Carson City, Nev. 60
FITCHBURG, Fitchburg, Mass. 63
PLAZA, Vernon, Tex. 64
STATE, Raleigh, N. C. 66
CHICAGO, Chicago, Ill. 68
CINDERELLA, Detroit, Mich. 70
FOX, Sidney, Nebr. 72
CENTURY, Flushing, L. I., N. Y. 75
NEW MOON D. I., Lake Charles, La. 76
ABC D. I., Oxon, Md. 80
SUNDOWN D. I., Whittier, Calif. 83
CLACO D. I., Liberty, Mo. 84
WADSWORTH D. I., Denver, Colo. 87
NORTH ANDREWS D. I., Ft. Lauderdale, Fla. 90
MOTOR VU D. I., Dallas, Oregon 92
BROKEN BOW D. I., Broken Bow, Nebr. 94
WESTBURY D. I., Westbury, L. I., N. Y. 98
FAMILY DRI-VIN, Tigard, Ore. 100
HILLSIDE D. I., Hillside, Md. 102
STARLITE D. I., Lansing, Mich. 104
REDA D. I., London, Ky. 107
CENTENNIAL D. I., Littleton, Colo. 108
DRUID HILL D. I., Maryville, Tenn. 110
SUNDOWN D. I., Mandan, N. D. 112

Drive-In Theatres

PANAMA'S FIRST DRIVE-IN.....*J. L. Putaturo* 114
Step-By-Step Study of the Planning and Construction of the First Drive-In Theatre to be Built in Panama

WIDE SCREENS FOR DRIVE-INS.....*John Selby* 118
An Analysis of the Various Factors to be Considered in Construction of Wide Screen Towers for Drive-Ins

PAINTING THE DRIVE-IN.....*Michael E. Spatz* 120
The Proper Use of Paints and Color at the Outdoor Theatre Often Results in an Increase in Activity at the Boxoffice

HEATING THE DRIVE-IN.....*E. A. Farr* 122
Use of In-Car Heaters for Outdoor Theatres Can Make It Possible to Extend the Drive-In Season

CHEMICAL FLY SWATTERS 124
Drive-Ins That Use Recently Developed Chemicals, and Proper Sanitation Procedures Eliminate Danger of Weeds and Insects

SWIMMING POOLS FOR OUTDOOR THEATRES
Wesley Bintz 127
Complete Information on Swimming Pool Construction, and How It Might Apply to the Community-Center Type of Drive-In Operation

BLACK LIGHT PEST CONTROL 134
A New Device Which Uses Black Light and an Electric Grid to Eliminate the Problem of Night-Flying Insects at D-I's

CHILDREN ARE YOUR BEST SALESMEN....*Claude Ahrens* 136
The Proper Equipment and Operation of a Playground is a Positive Method of Attracting the Kids and Their Parents to Your Drive-In

OUTDOOR SCREEN ADVERTISING 138
An Attempt to Better Acquaint the Drive-In Operator with the Subject of Theatre Screen Advertising Films

Advertising:

A

AMERICAN PLAYGROUND DEVICE CO..... 146

D

DAWO CORP..... 149
DIT-MCO, INC.....142, 143
DRIVE-IN THEATRE MANUFACTURING CO.....142, 143

E

EPRAD 151

F

FIRST-AMERICAN PRODUCTS, INC.....144, 145
FUTURAMIC EQUIPMENT CO..... 152

I

INTERNATIONAL PROJECTOR CORP..... 141

K

KOILED KORDS, INC..... 147

M

MIRACLE WHIRL SALES CO..... 150

N

NATIONAL THEATRE SUPPLY..... 141

T

THEATRE EQUIPMENT CO..... 151

W

WHITNEY BLAKE CO..... 148

DESIGN

1954-55

The Centre: A Symbol of Progress

Constructed At a Cost of $1,000,000, Denver's Centre Theatre Represents the Finest in Modern Theatre Design and Operation

The only first run to be built in Denver in 20 years, the Centre, has been opened by Fox Inter-Mountain Theatres, and has been acclaimed as "the most modern theatre in the world." Costing a million dollars, the theatre is located in the heart of the spectacular new skyscraper area in the heart of downtown Denver. It is the first opening of major importance in the United States in at least 13 years.

Model Theatre

From its massive, brilliant marquee to its rear exits the Centre is a model of the latest in theatre design and technical accomplishments. The stadium-type auditorium, 81 feet by 162 feet, has 1,247 deluxe self-rising spring back loge seats from the American Seating Company. They are of wine plush with rubberfoam cushioned arms. The indivual chairs are 21 to 23 inches wide as compared to the usual 19 to 20 inches. Of that "leg room" which first run patrons demand, the Centre has plenty. The seats throughout the auditorium measure 38 inches from back to back. The design of the auditorium is such that the tapering toward the front eliminated the wide-angle seats and the stadium auditorium makes for easier viewing over the heads of those in front.

The carpeting throughout the theatre is a custom job, in tones of gold, black and raspberry, and blends in well with the rest of the building and the seats. The carpeting job was designed and made for the Centre, by Alexander-Smith & Sons. To provide underfoot comfort, this 1,400 yards of luxurious carpeting is underlaid with three-eighth inch sponge rubber padding, and this is covered with thick hair padding.

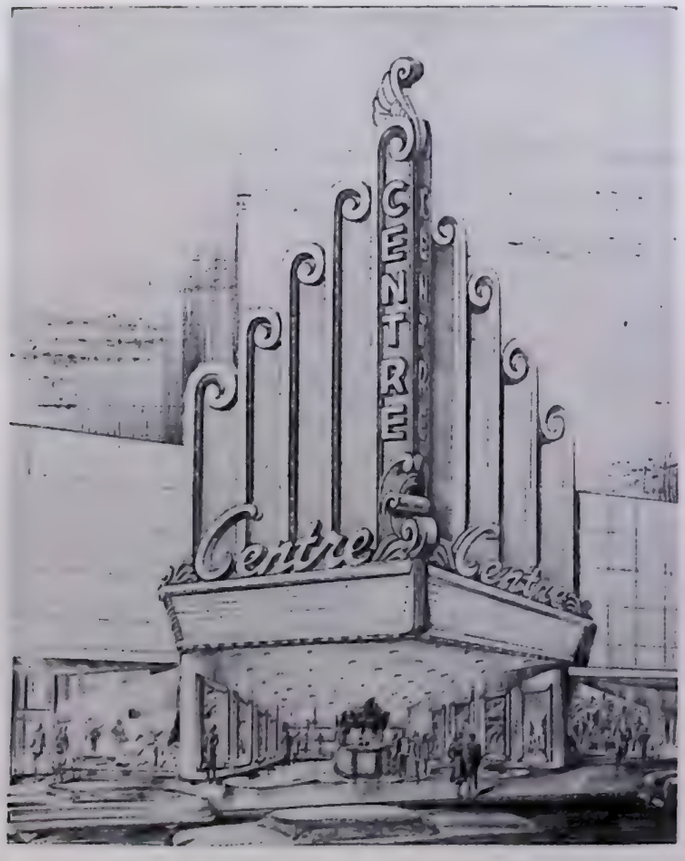
BRIEF: ***The movie-going public of Denver, Colorado . . . was recently treated to the opening of the first deluxe theatre to be constructed in that city in the past 20 years . . . and the first major theatre opening in the United States for almost 13 years . . . Constructed at a cost of more than one million dollars . . . the Centre is a brilliant example of how all the latest advances in building design . . . materials . . . and sound and projection techniques can be blended into one exciting theatre . . . It is also a fine example of the faith its owners . . . the Fox Inter-Mountain Theatres . . . have in the future of the motion picture industry.***

This article describes the various areas of the beautiful new theatre . . . and goes into detail about the exterior and interior decor . . . the projection and sound equipment . . . the color schemes . . . seating . . . etc. . . . All those who have seen this theatre agree that it is a source of pride for everyone in the motion picture industry . . . and a symbol of the progress made in the last two decades.

Interior Design

The interior design of the auditorium is dominated by extensive use of ornamental plaster from Ralph Wilson, Whittier, California, which decorator Edward Arnold has finished in gold and silver leaf. The interior reflects also a pleasing combination of the ultra modern and the conventional theatre styling as these large ornamental plaster plumes reach 60 feet above the floor, backed by a magnificent expanse of coral colored

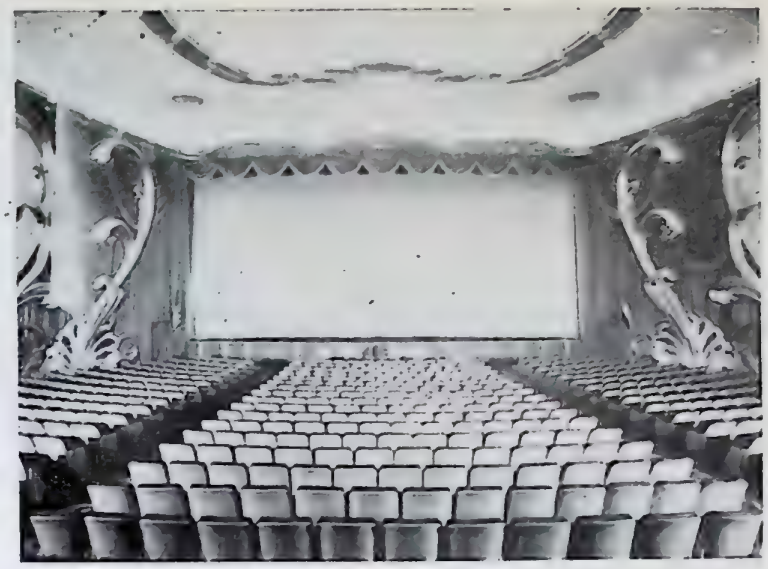
AFTER months of planning it was possible to have an artist draw a sketch (left) of what the front of this new theatre would look like when it was completed. When the Centre opened its doors to the public it was seen (right) that the original plan was followed to the letter. This theatre in Denver incorporated all of the finest and most modern advances made in the field of construction, and in the techniques of motion pictures.



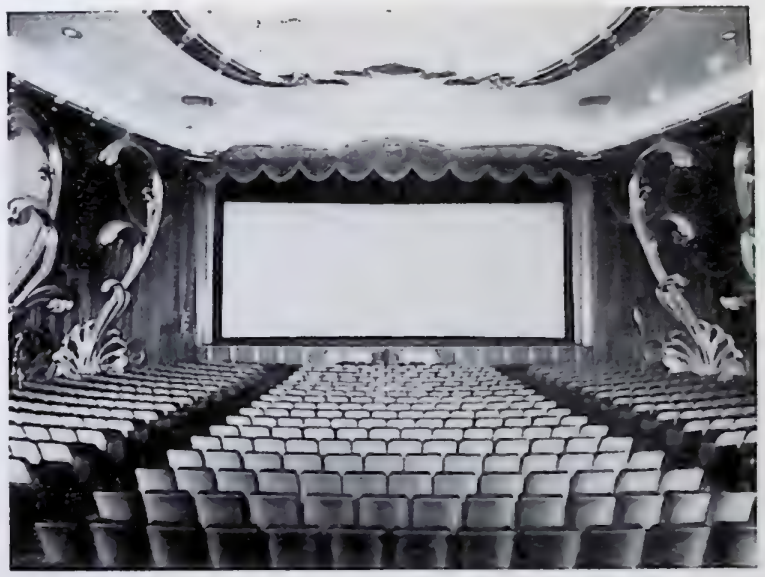




THE LUXURIOUS auditorium holds over 1200 spring-back seats that are a part of the many extras built into this exciting and new movie palace.



A VIEW of the screen curtain and draperies (above) which cost $12,000. The screen (below) is 28 feet high and 60 feet wide with movable masking.



THE MAIN LOBBY is spacious and immediately helps to create a mood of elegance and splendor. The architectural design and the furnishings are completely functional as well as pleasing to the senses. The furniture in the lobby and lounges was all custom-built especially for the theatre.





THE CONCESSION BAR (above) is 30 feet long and constructed of glass and aluminum etched into handsome designs. The men's smoking and restrooms (below) have also been given special treatment. Scenic outdoor wallpaper motif and comfortable furnishings are the highlights of this area.



IN THIS view of the Centre's downstairs lounge it can readily be seen that the decorative plan while ultra-modern did not go to extremes and concentrated on making areas pleasant and useful.



"waterfall" stage draperies from Grosh Sons Scenic Studios, Hollywood.

This plaster also is used to provide a coved lighting effect on a two-level ceiling, a ceiling so designed, lightwise, that there will be a total of 24 different color combinations available. The lighting will be used to create moods and atmosphere inside the theatre auditorium which will be in keeping with the attraction on the screen. Lighting throughout the theatre is indirect and all of it is designed to give the utmost in beauty, luxury and comfort to the patrons.

Draperies

The "waterfall" stage drapery, mentioned earlier, is one of the most outstanding decorative features of the Centre. The curtain directly in front of the screen is of the conventional type but the front curtain is an artistic triumph. This curtain will drop completely to the auditorium floor, covering entirely the front of the stage. The interior design has this same curtain material extending 40 feet beyond the stage on both sides behind the gold and silver ornamentation. Thus, patrons will be treated to almost 150 feet (the stage being 62 feet wide) of continuous drapery in front of the auditorium. The cost of the draperies was almost $12,000.

The Centre is completely equipped with an Ampex stereophonic sound system and was planned so as to be able to utilize other multi-sound-track controls. In fact, the Centre was probably one of the first theatres in the world in which the stereophonic sound system was worked into the architectural design of the building itself.

Walls of the auditorium are sprayed with asbestos fibre to insure perfectly engineered sound and acoustical control. The front-of-the-house portion of the theatre is equipped with a high fidelity music system. Music and sound can be "piped" to the lobby, lower lounge, concession counter and to the boxoffice and outside the theatre. The system is completely flexible so that music can be playing in one portion of the lobby and special sound going to another.

And speaking of concession bar, the Centre has one that will evoke a sparkle in any theatre manager's eye. Measuring some 30 feet in length and constructed of glass and aluminum, etched into handsome designs, this counter, from Sinicroupe & Sons, Los Angeles, provides the showiest confection showcase in the region.

The screen in the Centre is 28 feet high and 60 feet in width, making it one of the largest CinemaScope screens in the country. It is a curved screen, one of the Miracle Mirror type, built on a radius of 140 feet. Cost of the screen, without the metal frame, was $3,500. The screen is equipped with movable masking which will make possible the playing of any size or ratio picture.

Projection Booth

Coming into the booth you get the feeling that here is a projectionist's dream come true. The booth is about 40 feet wide and built for any type of operation, with space being provided for four projection machines. It is equipped



THE TICKET booth is so designed as to give a hint of what the interior of theatre looks like.

with Simplex XL projectors, Simplex LL-1 pedestals and National Excelite Lamphouses, 135 ampmeter. The booth has been arranged so as to allow for installation of Eidophor color theatre television, and was also planned in such a manner that it will be possible to use any new system or method of projection, including Todd-AO.

The theatre is also equipped with Simplex XL sound equipment, Simplex stage speakers (3) and Hertner converters. Transporting the film to the booth is facilitated by a dumb waiter installation.

Heating and Air Conditioning

Temperature and air conditioning is regulated by a complete Minneapolis-Honeywell control system. Heating is from two large individual boilers, heated by natural gas, and during the hottest summer days patrons will be kept cool and comfortable with the Westinghouse mechanical refrigeration unit, the largest theatre cooling unit in the region. It is anticipated that the air conditioning unit will remove as much as 85 per cent of the dust and pollen from the air, and the system is so sensitive that it will switch instantly from heating to cooling and vice versa. It is easily conceivable then, that the patron himself will regulate the temperature in the theatre. With a big crowd making an exit and consequently lowering the auditorium temperature, the cooling conditioning would be changed to one of heating.

All the furniture in the lobby and grand lounge is custom made and built to fit the various curvatures of the walls against which they rest. The rest rooms have been designed with a thought to eye appeal as well as to utility. The men's smoking room has scenic wall paper with an outdoor hunting motif, while the ladies' lounge is of a dogwood laurel design. This lounge has one long mirror covering the entire side of the wall, a mirror topped vanity bench extending the length of this same wall, and six swivel vanity stools.

Switching from the interior to the front of the theatre, it seems safe to say that the marquee, upright and display lighting of the Centre is unrivaled by any theatre between Chicago and the west coast. This display covers an area 60 feet wide by 100 feet high, and consumes 70 kilowatts of electricity. The marquee is constructed so that changing of reader panels will be done from the inside. The marquee utilizes two sizes of the Bevelite letters, the 17-inch and the 10-inch.

GIANT projection booth is 40 feet wide, and is so arranged as to allow for the installation of color theatre TV, or any other new process.

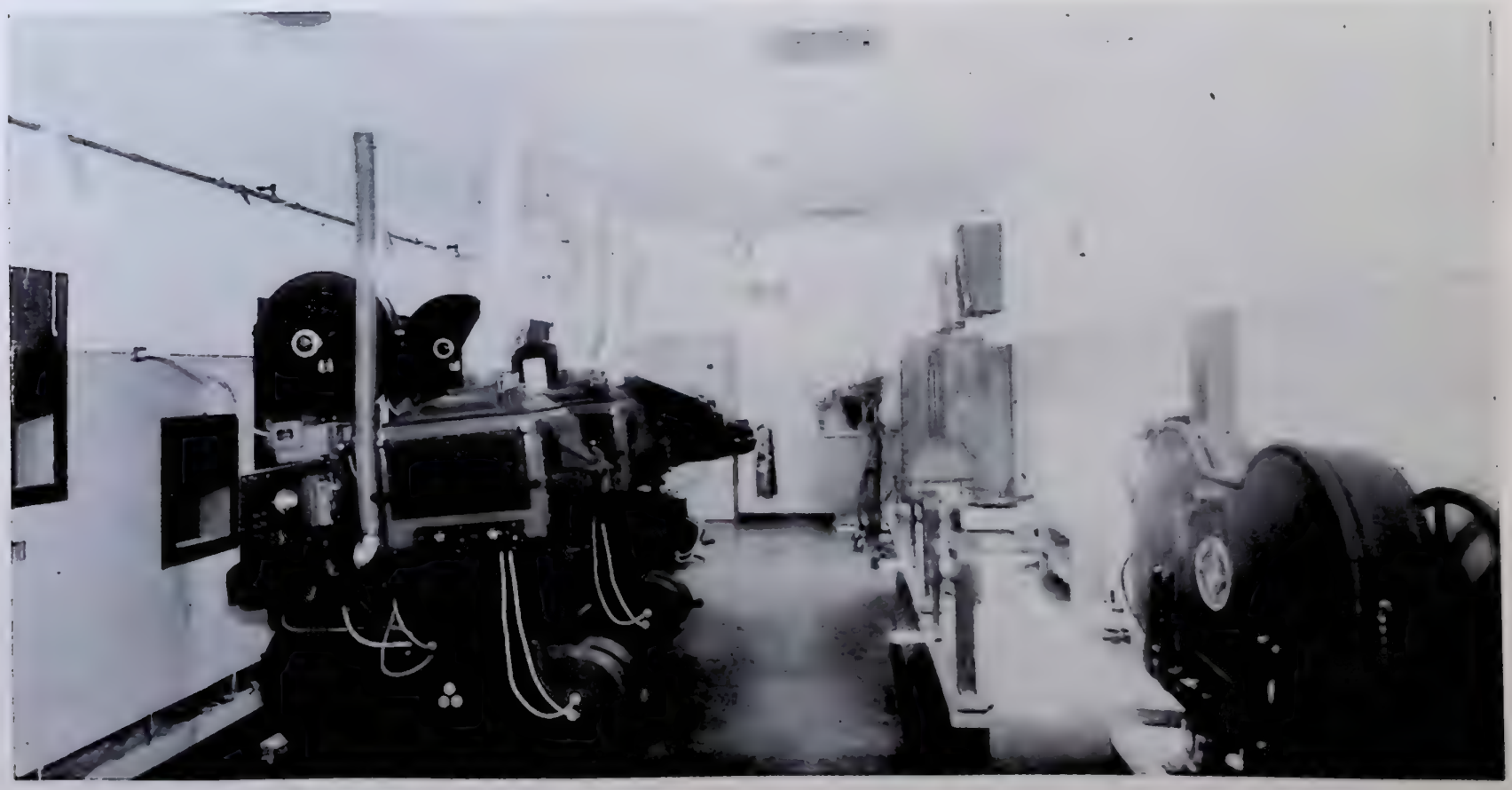


EVEN A heavy storm could not keep the crowds away from the Centre when it opened its doors

The lower portion of the theatre front is covered with terrazzo blocks that resemble pink marble. Massive stainless steel poster cases give the entrance "the look that movie theatres ought to have." And the floor of the entrance is covered with giant Columbines, Colorado's official state flower, 14 feet high and seven feet wide, in 16 different shades and colors from Mack Marble and Tile Company.

The cost of the Centre was one million dollars. The expenditure of money has brought forth a luxurious, pretentious motion picture theatre, a theatre which can be a pride and a source of inspiration for the entire industry.

Frank H. Ricketson, Jr., president of Fox Inter-Mountain Theatres, the man chiefly responsible for the building of the theatre, said: "The Centre theatre will stand as a symbol of the motion pitcure exhibitor's renewed faith in the future of the movie industry."



World Theatre Survey

Study of New Theatre Construction and General Conditions Currently Found in Various Countries Throughout the World

BRIEF: ***Perhaps no other major industry in the world today has the international scope and appeal of motion pictures . . . There is no other medium of communication better qualified to meet the tremendous demand for entertainment . . . knowledge about other peoples . . . and other lands.***

This article attempts to give the reader an indication of the activities and general conditions to be found in the motion picture industry of various nations around the globe . . . The latest theatres are described in words and pictures . . . and permit a comparison of design and trends to be found in such places as India . . . England . . . Germany . . . Spain . . . Chile . . . and many others. The staff of THEATRE CATALOG has assembled this material in the hope that what is to be found here will help bring about an exchange of ideas . . . and perhaps lead to a better understanding of the other fellow's problems . . . It is certainly worth the reader's time.

Few persons in the motion picture industry fully realize the tremendous appeal of this medium to all the peoples of the world. In all the four corners of this ever-shrinking globe the motion picture theatre brings its magic to great masses of populations.

Since the appeal of this medium is international, it is no more than proper, therefore, that the advances made also be the efforts of men working in different lands.

With the end of World War II the film industry began a revolution of its own, and the progress both in production and exhibition has brought the entertainment value and quality of motion pictures to its highest point of perfection. These advances were not restricted merely to projection and sound, however. The theatres in which the films are shown also have been touched by the magic wand of progress, and faithfully reflect, in their sleek functional exteriors and interiors, the finest and most modern architectural thinking.

In order to give a fuller understanding of this great industry that yields to no boundary of nature or man, the editors of THEATRE CATALOG have assembled in words and pictures, a brief survey of world theatres.

CHILE

In spite of the great increase in the cost of construction, due to the constant inflation that is to be found in this country, a number of new theatres have been built in the last 12 months, and additional theatres are under construction and will be opened in the near future.

New Theatres

One of the finest new houses is the Astor Theatre, in Santiago. It is a deluxe first run house located in the center of the city, and was the first theatre in Chile to be equipped for 3-D and CinemaScope.

The first film to play this house was Warner Brothers, "House of Wax," in 3-D, and it did exceptional business. Following this run, "The Robe" introduced CinemaScope to Chile, and it ran at the Astor for 13 weeks. This film set a new record for a boxoffice gross.

In addition to the Astor, five other new theatres have opened in Santiago. In the town of Tocopilla, in the north, the Forida Theatre was built, and in the small town of Quinteros the Arturo Prat Theatre was also opened.

At the present time in Santiago, the capital of the country with a population of 1,500,000 inhabitants, other theatres are being completed. They are the Pacifico Theatre, the San Martin, and the Ritz, all of them located in the center of town. Also just getting underway in this city is a large office building which has provisions for a deluxe 1400 seat theatre.





THE ASTOR, in Santiago, Chile, was one of the first theatres in this country to be equipped both for 3-D projection, and for CinemaScope.

General Situation

The general situation of the movie industry in Chile currently is rather difficult. To begin with, the imports are restricted and they are made through import permits that are authorized by the National Exchange Control. During the present year, and due to the serious situation of copper in the world market (copper is the main export product of the country) and the resulting extreme scarcity of dollars, the import budget for the calendar year of 1954 has been severely reduced, reaching to 40 per cent of the original amount.

Under these circumstances, the American companies must present to the Exchange Control their commercial invoices on the basis of the footage of their films, calculated at the rate of 10 American cents per foot of Technicolor prints and five American cents per foot of black and white prints. With their import permits so strongly reduced, they only are able to import a part of their line-up.

Once the shipments arrive in the country, the companies are authorized to remit to the United States the corresponding values of their invoices on the basis previously explained, and provided there are in the local exchange market the necessary dollars.

The Exchange Control accepts applications periodically against royalties and profits, but the authorizations to remit and the remittances of same are always late and restricted.

Notwithstanding the inflation that, from February 1953 to May 1954 has increased cost of living by 87.79 per cent, and 22.7 per cent from January to May 1954 only, the price of the localities in theatres have been frozen from the month of June 1953 and the top price for stalls in first-run theatres is $50. (Chilean Pesos) in general, and $75 for 3-D and CinemaScope exhibitions.

As a general rule, films are sold on percentage to the first-run theatres of the principal four cities of the country, namely: Santiago (1,500,000 inhabitants), Valparaiso (300,000 inhabitants), Concepcion (140,000 inhabitants) and Vina Del Mar (100,000 inhabitants), and on flat prices to the subsequent runs in these cities and to the theatres in the provinces, with the exception of the most important productions.

In Santiago there are direct offices of all the important American companies: Columbia, 20th-Fox, Metro, Paramount, Republic, RKO, Universal, United Artists and Warner Bros. and also of the Mexican Producers through Pelmex.

Metro is the only American company having its own release theatres in the cities of Santiago and Valparaiso.

Several independent distributors import to the country the films from Europe: French, Italian and British pictures and another distributor represents the Argentine films. During 1954 there has been a big increase in the number of Italian releases, and some of them have obtained a big boxoffice success.

Going back to the new techniques, besides the Astor Theatre already mentioned and equipped for 3-D and CinemaScope, the general situation in this moment is the following:



ONE OF the finest new theatres to be constructed in Havana, Cuba, is the Payret. Broad modern lines have been used in the design of the interior. The front still retains the flavor of its national origins.







Installations to date:		
SANTIAGO	Metro Theatre	3-D Panoramic Screen
	Dante Theatre	3-D Panoramic Screen
	Astor Theatre	3-D Wide-Screen CinemaScope
	Central Theatre	3-D Panoramic Screen
	El Golf Theatre	3-D Panoramic Screen
VALPARAISO	Metro Theatre	3-D Panoramic Screen
Installations pending or being installed:		
SANTIAGO	Metro Theatre	CinemaScope (Perspecta)
	Las Lilas	3-D Panoramic Screen CinemaScope
VALPARAISO	Metro Theatre	CinemaScope (Perspecta)
	Velarde	3-D Wide-Screen CinemaScope
CONCEPCION	Explanade	3-D Wide-Screen CinemaScope

Films in 3-D like Warner's "House Of Wax" and Universal's "It Came From Outer Space" have secured big results, but unfortunately the reaction of the public to the polaroid glasses has been very bad; mainly due to the fact that it seems that the glasses were received in bad condition even before they were used.

CinemaScope has been very well received, especially with a film like "The Robe" which lends itself admirably to that system, and which would have obtained a great reception even in 2-D.

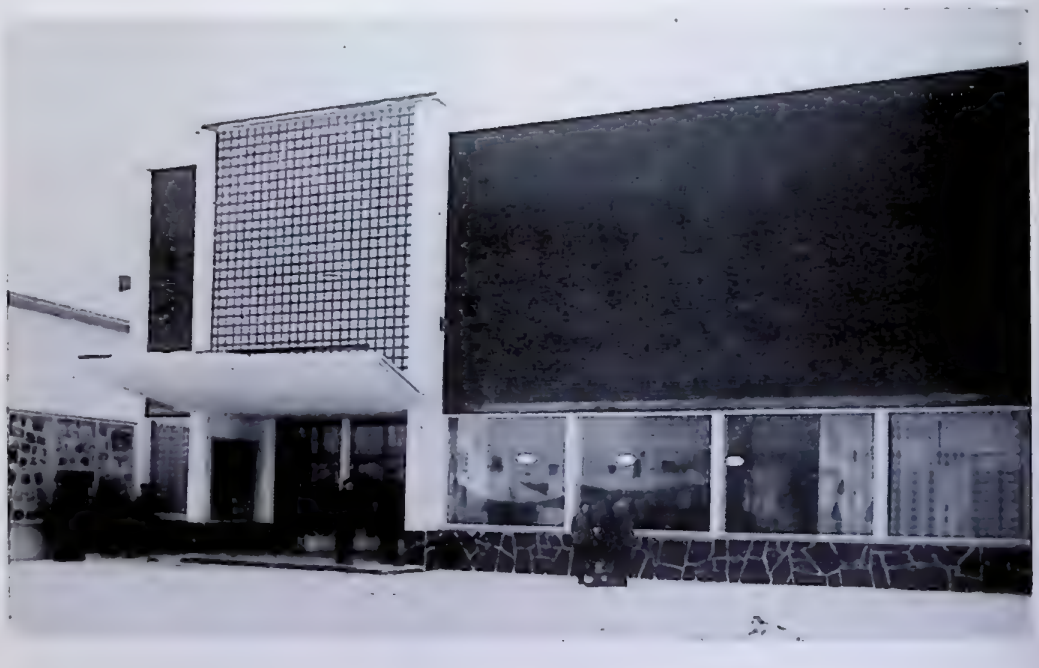
Censorship

In Chile there exists a Censor Board established by law, to which must be submitted all films arriving to the country before they are released to the public. This Censor Board uses the following classification: 1) Approved for general exhibition; 2) Approved only for adults; 3) Approved only for adults and not recommended for young ladies, and 4) Rejected. In general, the censorship acts very equitably and the difficulties with it are very scarce.

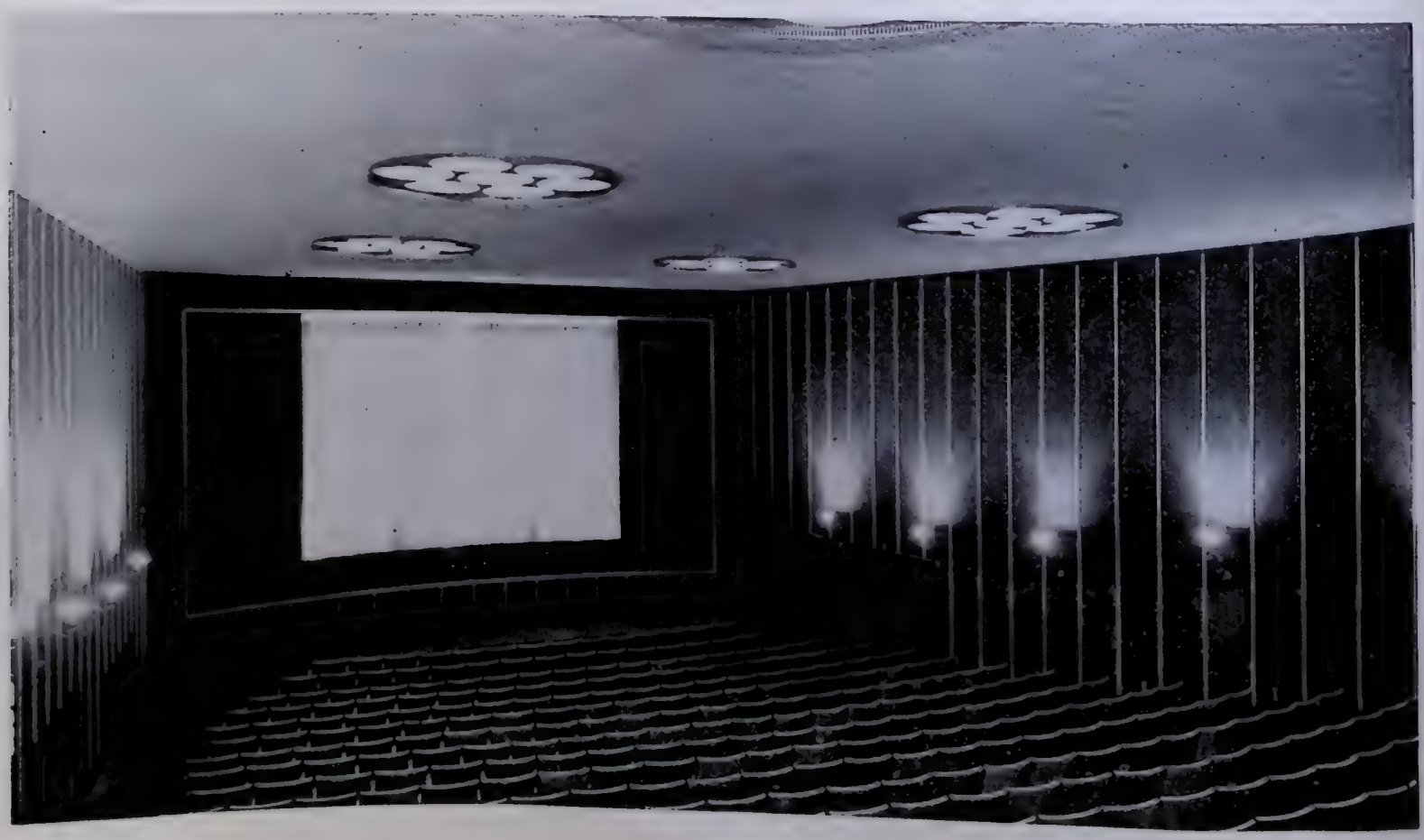
Theatres' localities are subject to different taxes. For instance, one stall priced at $50. (Chilean Pesos) is taxed 23.66 per cent, this is, from the gross price to the public of $50, the locality pays $11.83 in taxes and there remains $38.17 to be divided between the exhibitor and the distributor.

CUBA

Just the time when the famous National Hotel of Havana opened, 1928, was the year when the then exclusive Encanto — a 1500 seat theatre — was inaugurated. It was really a fine theatre,



PROOF THAT the new screen processes have truly made an international impression can be had by paying a visit to the Nuijamies Theatre, in Lappeenrant, a town in the east of Finland. This theatre has a seating capacity of 506, and was the second theatre to be fully equipped with a wide screen.

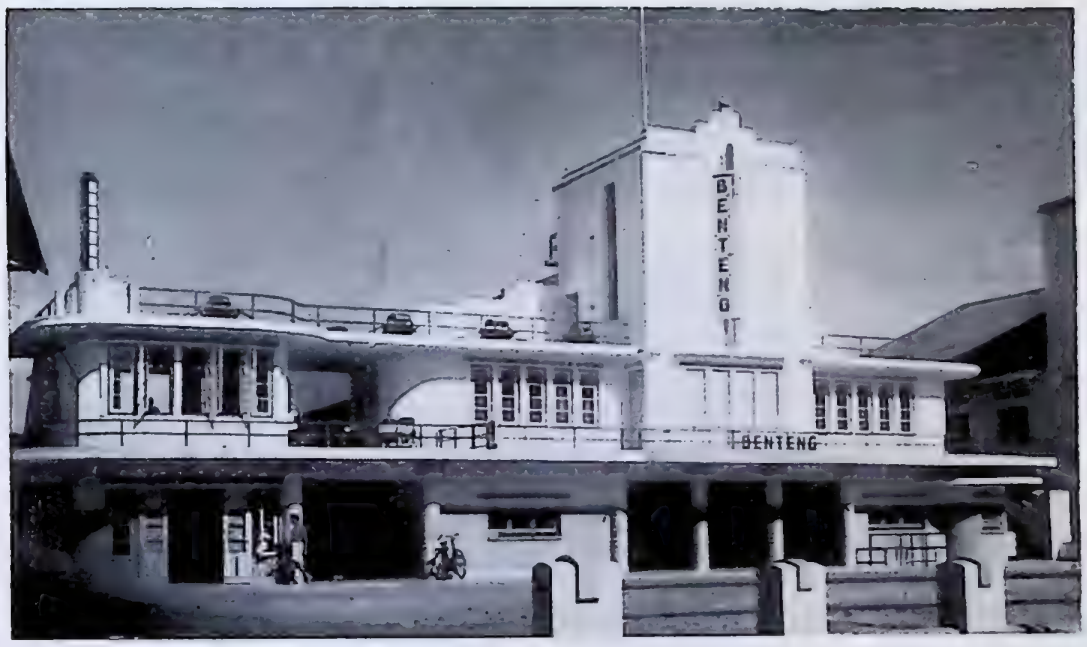


beautifully decorated in Spanish Colonial style, comfortably furnished and the first to have air conditioning in Cuba. Every week there would gather the best audience in town and following the tradition of the old opera house, the lights went on at 9 p.m. for the exquisite fashion and jewels show put on by the public as they came in and were ushered to their respective numbered seats. There was a gala show at 10 p.m. every evening and the newspapers society columns would meticulously report the event.

Conditions were adverse from an economical point of view, and the Encanto theatre enjoyed that exclusive position in Havana for many years, as no similar tneatres could be built.

Things started to improve in the country during and after World War II and as time went on, progress laced a long string of modern new theatres. The exclusive Encanto died and with it the traditional opera idea of the audience. The movie era was on!

The breakthrough was made by the America Theatre. It was built and equipped with all the modern advantages. It was a success in every respect, particularly in the way of drawing patronage from all social spheres. The America established the continuous show, in the manner of the American theatres, and the idea has held up to this date.



MAKING EXCELLENT use of pillars and terraces, the Benteng Theatre (above), in Menado, Indonesia, is one of the newest theatres in that land. The Delite Theatre, (below) New Delhi, India, boasts modern design and a blending of the architectural motifs of both the East, and the Western World.





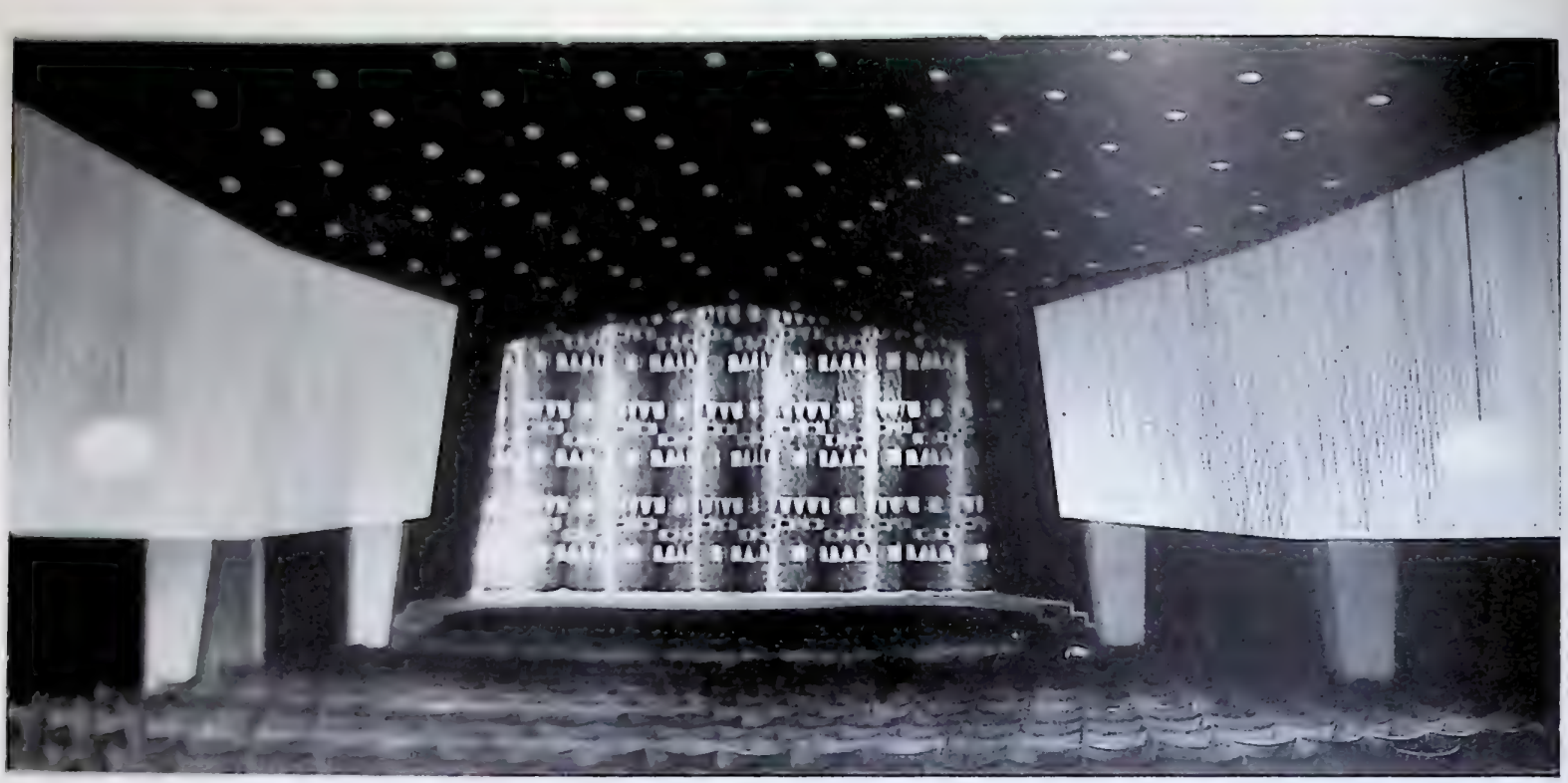
Theatre Construction

Soon afterwards theatre construction was at its peak, with Havana enjoying the largest proportion. First class theatres such as Radiocentro, Miramar, Metropolitan, Arenal, Ambassador, Infanta, Atlantic, Astral, Alameda, Avenida, 23 and 12, Rodi, Payret and others were built and equipped with the very best available in North America, including air conditioning.

Other theatres were remodeled, such as Fausto, Alkazar, Santa Catalina, Moderno, Radiocine, Trianon, Riviera and others, also fairly well equipped and air conditioned. The above mentioned theatres average about 1700 seats and admission price averages around 70 cents.

Throughout the Island, outside of Havana, a few theatres were built: Aguilera, in Santiago de Cuba; Infante, in Holguin; Banes in Banes; Alkazar in Camaguey; Silva in Sta. Clara; Cardenas in Cardenas; Aida in Pinar del Rio, and many others in smaller towns. Holguin has the largest theatre outside of Havana, the Infante, with 2450 seats. It was built by a cattle millionaire of that section to perpetuate his name. Blanquita, in Havana, also built by a local millionaire in memory of his deceased wife, is the largest in Cuba, and one of the largest in the world. It has 6750 seats. It is closed most of the time, since it is too expensive to operate, and is located out of the way.

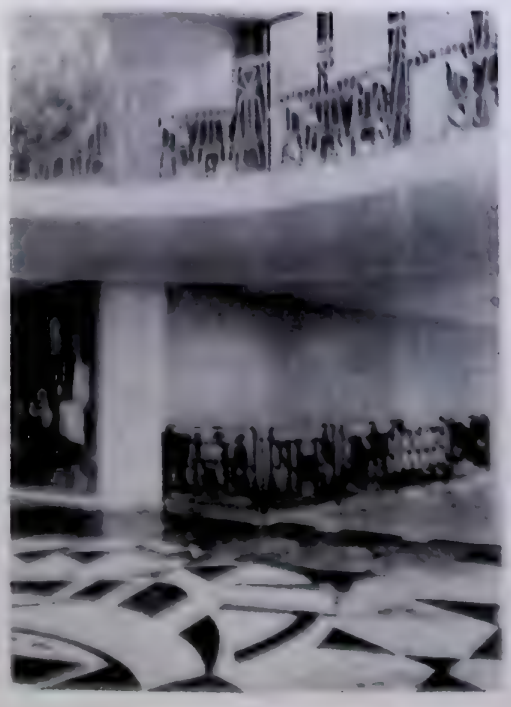
The other theatres average around 1500 seats, but very few are air conditioned. Many smaller theatres were remodeled and equipment improved. Air conditioning, — very important in this semi-tropical climate — in the provinces, is a very problematic item. The initial outlay in itself is uneconomical, but according to reiterated statements by the







Two striking new Swedish theatres are the Forum (top and above left) and the Teaterbio (above and below). Both of eye-catching design.



theatre operators, the greatest handicap is the upkeep. The power bill runs to figures beyond the possibilities of the theatres' limited earning capacity.

New Theatres

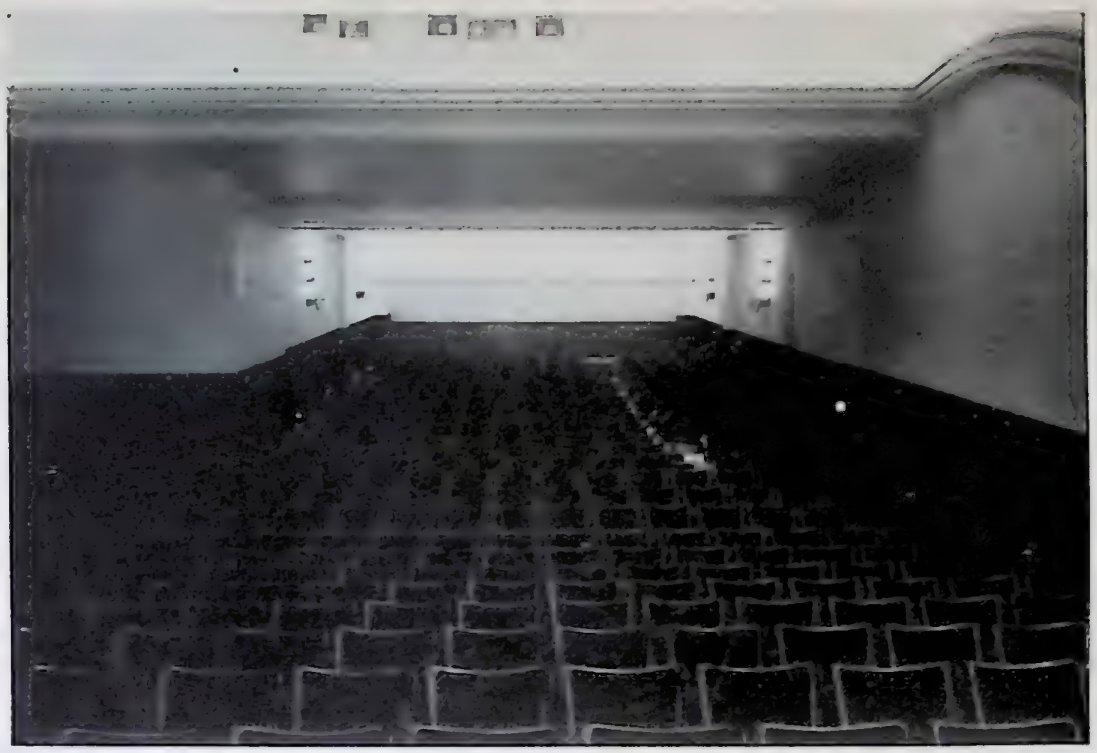
The construction of new theatres in Cuba is facing a crisis at the present time, due to various factors: Television — so well developed that this country is regarded second only to U.S.A.—represents the thoughest competition ever encountered by theatres in this country. There are five channels in Havana and one of them cover the entire country through relay stations, with the result that TV is available everywhere in Cuba. On the other hand, economic conditions, in general, show a marked contraction trend and consequently the exhibition business is not as favorable as it used to be. Therefore, theatre owners can no longer expect high returns from their [illegible]

Finally apartment houses and office buildings, both for rent and for sale on the horizontal ownership basis, have been so profitable in the last few years that all important private investment is going into these high and healthy returns.

Theatres have also met the great handicap presented by the ever changing processes in the last two or three years, as they have in other parts of the world. Some of them have kept up with circumstances installing 3-D, wide-screen, CinemaScope, etc., but not in a noticeable number. Any appreciable expenditure for such new developments is practically impossible for perhaps over 90 per cent of the theatres in Cuba. Their possibilities and actual earning capacity will not afford it for years to come.

[illegible] the normal picture lasts in the [illegible] theatre, [illegible] a substantial [illegible] does not show gross the box at the present time. There is no doubt that there is plenty of room for remodeling and re-equipping a large number of theatres both in Havana and throughout the [illegible]. If the normal picture industry does [illegible] with a permanent process that may be accepted, and if





THE METROPOLE, (above) in Bilvorda, Belgium, has an unusual front. The Orly, (right) is in Brussels. The theatre can hold up to 550 patrons.

adaptable to all, and the price settles at a level available to the possibilities of a larger proportion of the theatres in general, there is a great field for improvement in the next few years.

INDIA

There are approximately 2550 cinemas in India. The vast majority of these are antiquated in structure and design. In addition, there are about 500 mobile cinemas which service out of the way villages. During the past two years there has been a slight increase in the construction of new theatres and, at the same time, a substantial increase in the renovating and remodeling of existing cinemas, particularly in towns and cities such as Delhi, which are developing rapidly.

The increase in remodeling can be attributed in no small measure to the new means of presentation of motion pictures. The wide screen has come to stay and many theatre owners have found it necessary to make major structural alterations in order to install the latest wide screens.

Slight Improvement

In recent months, there has been a slight but distinct improvement in theatre business. This is a welcome change from the downward trend that has been experienced in the industry following the lush war years and the immediate post-war period. The improvement in business can be attributed, among other things, to the improved economic position brought about to a great extent by two good monsoons during each of the last two years, an improvement in the calibre of the pictures in release, and the renovations made to many of the cinemas.

Crippling taxes are having a deterrent effect on the progress of the industry. Exhibitors are obliged to pay a heavy entertainment tax as well as Municipal show tax and Octroi (a form of internal duty). In addition, it is compulsory to screen the Government Newsreel for which the exhibitor must pay one per



THE ODEON in Singapore, has a seating capacity of 1,625, is air-conditioned, and is also fully equipped for CinemaScope and regular films.



ALTHOUGH there is no competition from television, the Spanish public insist upon seeing good pictures and in comfortable surroundings. One of the better theatres in Spain is the Coliseum in Santander.



cent of the theatre takings, up to a limit of Rs .150 per week.

The Film Federation of India is continually pressing the Government for some relief from these taxes.

Three-Dimension films, Wide screen, CinemaScope and Stereophonic Sound have all served to maintain the interest of the picture-going public, particularly that section of the public which patronizes those houses devoted to the screening of English pictures.

Production

The indigenous film production industry is substantial and succeeds in producing between 220 and 250 feature pictures per year. These are responsible for producing at least 90 per cent of the box-office receipts, the balance coming from films imported from foreign countries.

Any exhibitor contemplating the construction of a new theatre or extensive remodeling must be possessed of infinite patience, as he must first of all secure permission of several governmental and semi-governmental bodies, which in itself takes considerable time.

Before construction of a new theatre or remodeling of an existing one can be undertaken, permission must first be secured from the Commissioner of Police and the Chief Officer of the Fire Brigade. Following this, plans must be submitted to the City Engineer of the Municipality, as well as the Drainage Engineer, for approval.

Building regulations vary from state to state, but generally speaking follow a similar pattern.

It is also most important to secure an understanding from the local body responsible for power supply that the necessary power supply will be made available.

There are restrictions on the supply of certain building materials such as iron, steel and cement. An application must be made and the plan submitted to the Government Controller of these commodities, along with detailed information regarding the quantity of steel, cement, etc., required.

There is no difficulty in obtaining skilled laborers, carpenters, electricians, and so forth. Thus, once all the preliminary approvals have been secured, building operations can proceed quite rapidly, provided of course, there is adequate supervision and proper planning.

Weather a Problem

One of the principal problems which theatre owners have to contend with is that of the weather. During the four months monsoon period theatres are subjected to almost continuous heavy rain. Thus, waterproofing of the theatre roof is of the utmost importance. Otherwise considerable damage could be done to ceilings and insulated ducts. Between monsoons, cinemas are subjected to intense heat, and this together with the monsoonal rains, spoils the facades of many theatres.

The intense heat constitutes a major problem for theatre owners. Several of the first-class theatres in large cities are air-conditioned, but the majority depend upon ceiling fans and cross ventilation for relief from the heat.

In the construction of new theatres there is a definite trend toward simplicity in design and the use of subdued colors. This represents a distinct departure from

the ornate designs of many of the older theatres.

SINGAPORE

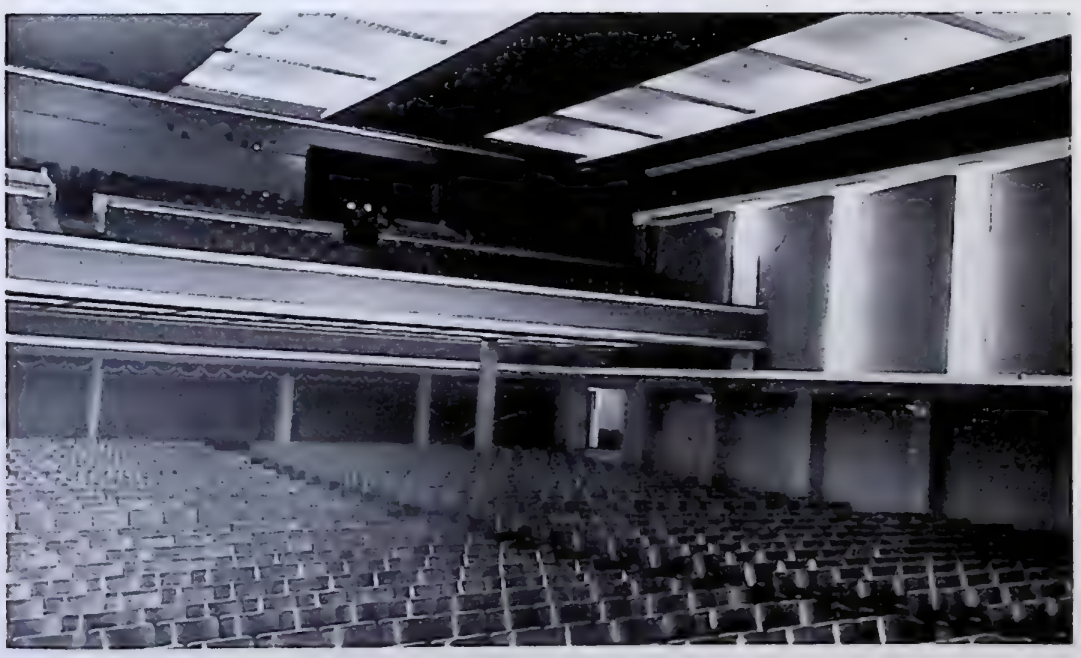
Odeon Theatre

The Odeon Cinema offers its patrons a host of amenities hitherto not known to theatre-goers in this country. For instance, there is a special booking office for car drivers enabling them to buy their tickets in advance without having to leave their cars. All they need do is to drive in past the entrance foyer, lean out of the car window and make their booking.

Another unusual feature of the cinema is that the whole building is, as it were, on stilts (albeit extremely strong ones), so that the ground floor area becomes a convenient and spacious car park. Should this be full, a ramp sweeps up at the back of the theatre to provide further parking space on the next story.

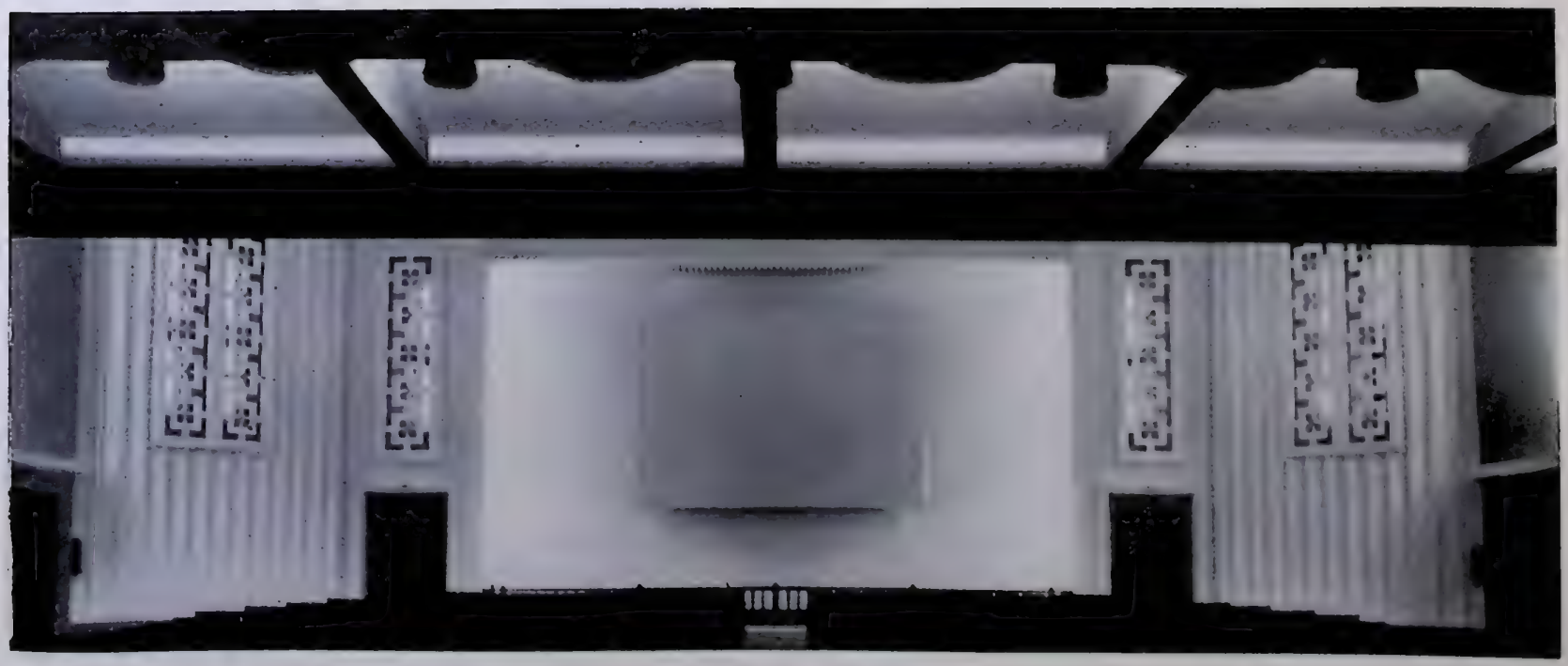
The Odeon is equipped with a cry room for the benefit of those parents who cannot leave their young babies at home.







ANOTHER top Spanish theatre is the Cine Balmes (top and above), in Barcelona. The Monterrey has an unusual auditorium design (left and below), that helps to attract patrons.







ALTHOUGH theatre construction in France has not been heavy there has been some activity along those lines. Seen on this page are photographs of the Le Bosquet Theatre, in Paris. This is a tastefully designed and decorated house which has the facilities to seat 820 persons comfortably.

Deaf hearing aids are also provided for those who require them, special monitor panels having been fitted to ensure good hearing.

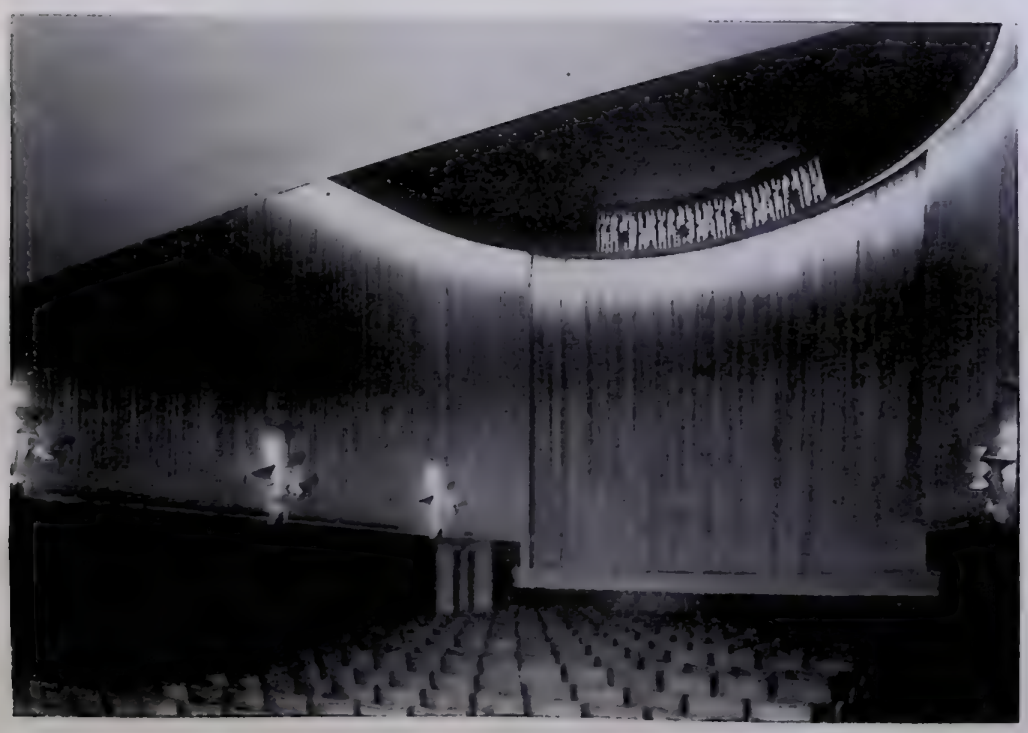
The Odeon is fully air conditioned and, should electricity fail for any reason, there are two 112 k.w. Bohn & Kahler generators ready for immediate service.

The Odeon is equipped for 3-D screenings, as well as for CinemaScope and standard films. Four G.B. Kalee projectors which can be locked in pairs have been installed.

The four foyers each have their own bar and own color scheme. Formica has been used for table tops and counters, and a new material has been introduced in front of some of the bars called "Dernside" which is a plastic material,—in this case ribbed with gold and silver.

The floors are tiled throughout in grey and green mosaic except for the circle lounge which is rubber tiled.

The overall dimensions of the building alone are 6500 square feet—415 tons of steel went into its construction, 540,000 bags of cement, 86,000 cubic yards of sand, 87,000 cubic yards of granite and half a million bricks. The maximum number of laborers employed in any one week was 200; the Otis elevator travels at 200 feet per minute; the generators total altogether to 224 kilowatts; the glittering gold of the 100 foot tower is made of anodised aluminum sheeting; the automatic safety curtain cost $30,000.



There is a candy shop, soda fountain and a milk bar.

The seating capacity of the theatre is 1,645.

There are, too, "hidden assets" which, though vital, are not necessarily apparent to the patron, such as the film hoist from the ground floor to the projection room, the spacious artists' studio, the many new features in the bars, the special bottle coolers, and so on.

Backstage is a world of its own. There are eight dressing rooms and showers, flies for scenery fitted to the roof, an extra large door placed at such a height that scenery can be unloaded from a truck straight on to the stage, and a mass of equipment for lighting. This latter consists, to mention a few of the items, of a seven-color telescopic flood light, "spots" and a wonderful lantern which, with an automatic color wheel, can create new worlds upon the silver screen—rainbows, snow, the flames of a forest fire, forked lightning or cool waterfalls.

No wave of a wand enabled its owner, Loke Wan Tho, to complete this giant project. Instead, there were months of careful planning and hours spent on scrutinizing and finalizing details for the approval of the City Council. Once official sanction had been given for a first class cinema on land which had been in the owner's possession since 1938, plans went ahead and the demolition of the old houses on the site began. Thus on Sep-

tember 18, 1951, the first tests were made preparatory to driving the piles.

The foundation laid, work on the erection of the building itself started early in 1952. The theatre was opened to the public on June 8, 1953.

SPAIN

Theatre construction in Spain has been steadily increasing in the past 10 years.

As an investment it has proved to be the most productive in real estate, since the lease rents paid by the exhibitors are far higher than in any other kind of building.

On the other hand, all the materials used for the construction and equipment of such theatres are national and can be easily found in the market.

However the building of a new theatre is restricted by the Motion Picture Syndicate, which has a veto power, if their members consider that the town, village or suburb where the new theatre is projected, has enough seats in the existing theatres in the same location to take care of its population.

This although it is a measure of protection, nevertheless, works two ways, i.e., prevents from having better theatres, where there are only stables, and creates a sort of monopoly for the existing theatres.

The increasing number of theatres in a certain situation, does not mean an improvement in rentals, when it goes above saturation.

We shall illustrate this statement with an example:

Suppose you have a town with 50,000 inhabitants, which means approximately a theatre attendance of 6,000 people, at an admission price of 30 cents. You have actually two theatres in that situation therefore the receipts will be $1,800 in full, against an overall expanse of 2 x.

A new theatre is built. The attendance is not enlarged, therefore, the receipts are still $1,800 and yet the expenses have gone up to 3 x. Consequently the exhibitor will earn less money, and the same will happen to the distributor, as the same receipts will have to be split amongst a larger number of pictures.

It is therefore desirable that the seating capacity is well balanced with the population, to make out of it a sound and profitable business for all parties concerned. But it is just as important that wherever the theatres are old and badly equipped, the new construction replaces the old one, instead of adding up seats which are not needed.

Television

There is no television is this country. However, the public is selective. The days when going to the movies was a habit, regardless of the pictures, are gone. Some reasons for this are:

Movies are no longer a cheap form of entertainment.

If the show does not appeal to the public they prefer to stay home or find other forms of entertainment.

Although television is not found in Spain, this medium has affected the foreign market. When Hollywood was forced to cut its production because of the inroads being made by TV in the United States, the results showed up in our import of these films. Fortunately, the competition of television in America seems to have weakened, and the product recently produced, or in production, has been of a much higher quality, which will certainly be reflected in the overall receipts of these films in Spain.

GERMANY

The Elysee Theatre, in Aachen, has to be considered as one of the most modern theatres in Western Germany. Its construction and equipment is based on the latest developments in the film industry.

The theatre, which was opened January, 1954, has a seating capacity of 667. It has a sound system that is usually installed in theatres with a capacity up to 1600 seats. The theatre is equipped

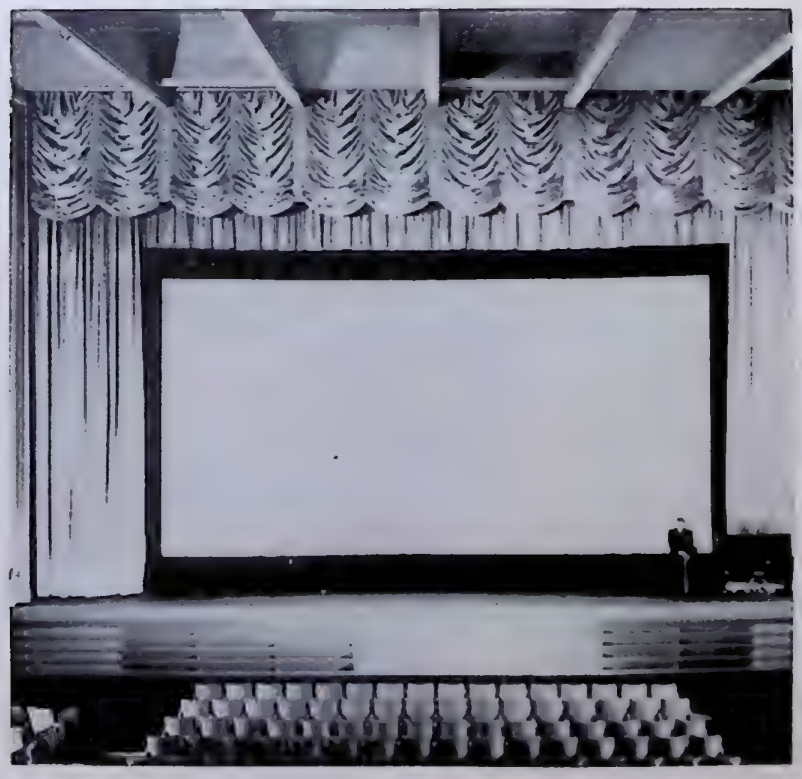


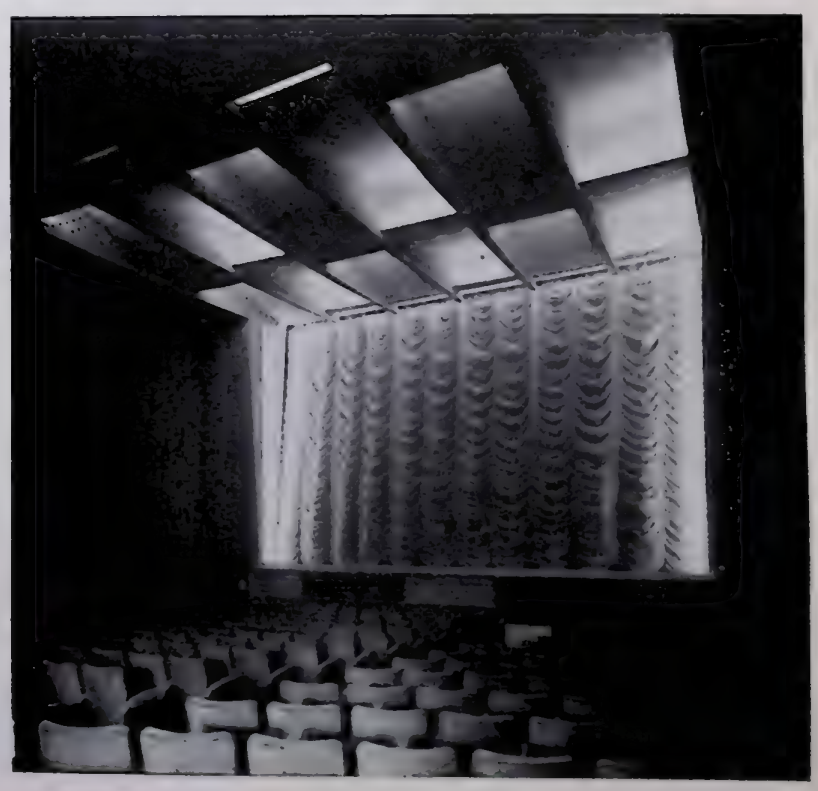
THE PALACE, in Grenoble, is another new addition to the Gaumont circuit in France. It has a 875 seating capacity, and as can be seen below, it is equipped for wide screen pictures.

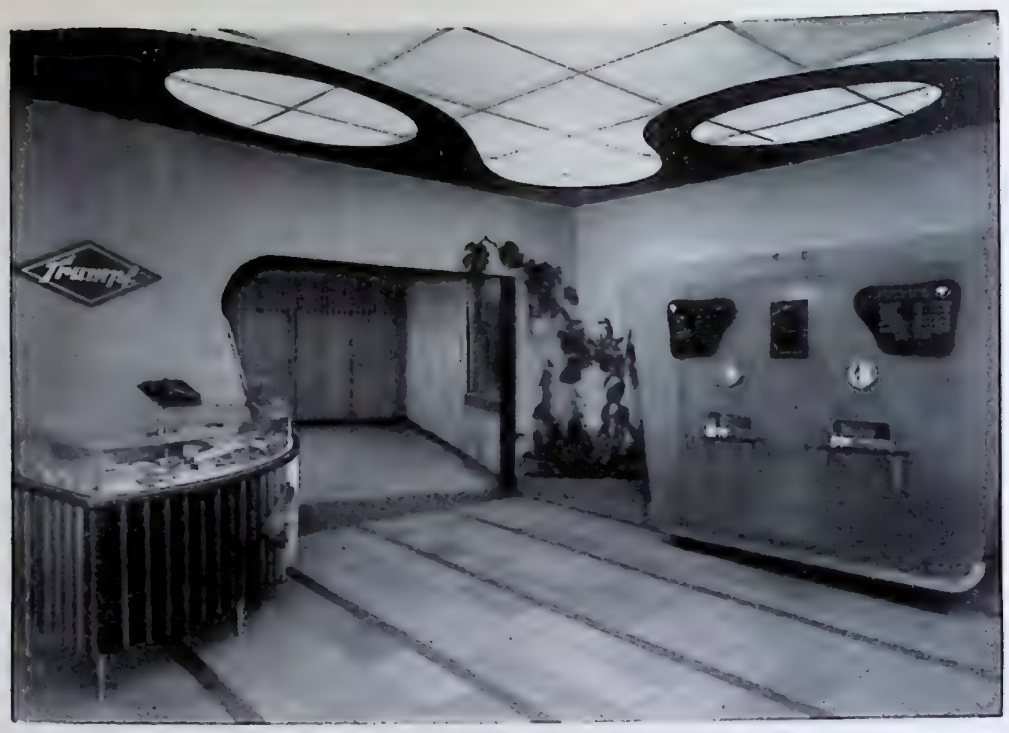
with a CinemaScope screen, and all the other necessary pieces of equipment needed to show films in this process. Illumination in the auditorium is controlled by the latest type of fading and dimming system. The stage is provided with two curtains, and they may be controlled either from the projection booth or the stage. The theatre is completely air conditioned.

The Elysee is a completely new building located in the heart of Aachen. The two brothers who own the theatre are the sons of the man who opened the first theatre in the city in 1912.

All the theatres owned by the family were destroyed during the last war, and rebuilt after 1945. These were the Rex, rebuilt in 1946; the Burg, rebuilt in 1954; and the Elysee, in 1954.







The Elysee plays the best international productions. Features such as the luxurious lobby, rows of seats in different colors, the auditorium ceiling which looks like a flying saucer, indirect lighting, and an impressive front makes this an outstanding house.

The Studio

The Studio, in Dusseldorf, was opened December, 1953, and has a seating capacity of 220. The theatre plays first-run product, and is considered to be one of the most modern theatres in the city. It is equipped with a CinemaScope size screen, and its two Zeiss Ikon projectors are equipped for optical and magnetic sound.

An unusual feature of the Studio is a bar which has been built in the rear of the auditorium. It is separated from the audience by a glass wall. This wall is equipped with a loudspeaker making it possible to stay at the bar and see and hear the film. There are also several loudspeakers fixed in the bar to give a stereophonic sound illusion.

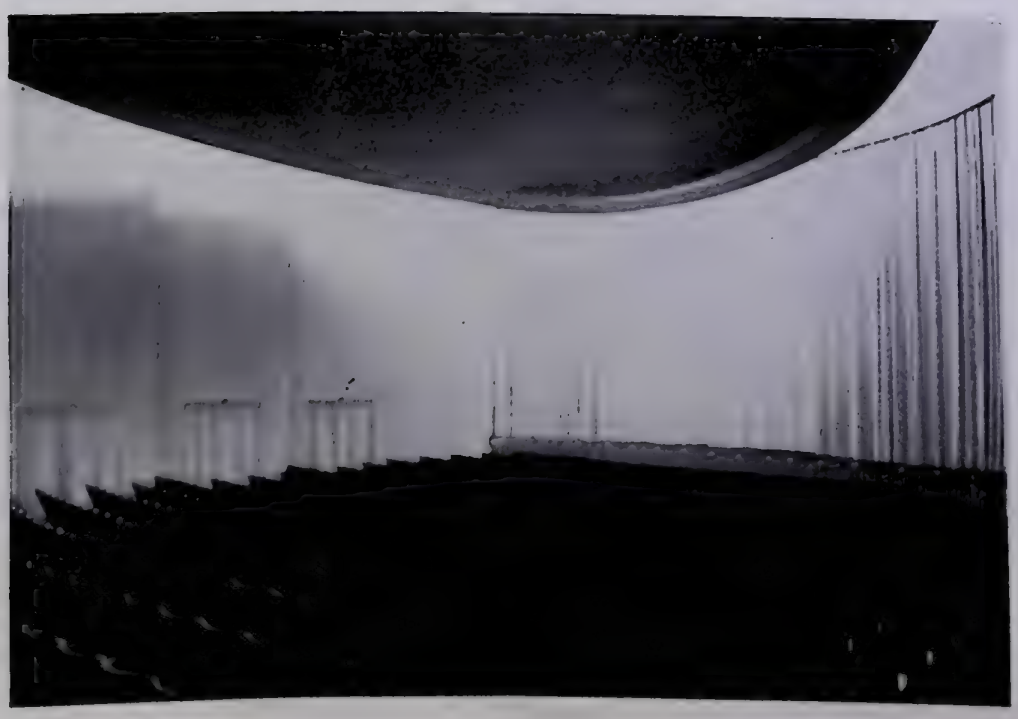
The bar, as well as the rest of the auditorium has its own special heating and air conditioning systems. The main auditorium has a gas heating system, while the bar is warmed by an electrical heating system.

The color scheme in the auditorium is black walls, lilac-colored seats and a silver curtain. On the left side, the wall is covered with the same material as the curtain. The very attractive color effect is improved by the indirect lighting.

AUSTRALIA

Sydney - Melbourne

The Regent theatres in Sydney and Melbourne are two of the ace houses in Australia. Both are equipped for CinemaScope Reproduction. The Sydney Regent Theatre has a seating capacity of 2169, a screen size of 52 by 22 feet, the CinemaScope picture size being 44 by 19 feet.



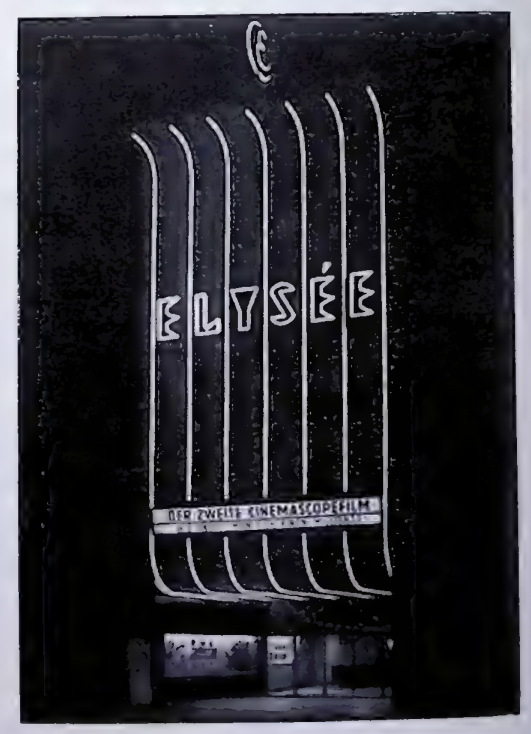
Three 100 watt channels provide the stereophonic sound and 20 loudspeakers mounted on the auditorium provide the "surround" effects.

The Metro houses in Sydney, Melbourne, and Brisbane are equipped with Perspecta Sound using Westrex 50 watt channels. The St. James, Sydney, Metro Collins, Melbourne, and the St. James, Brisbane being the principal houses in this circuit.

ITALY

Rome

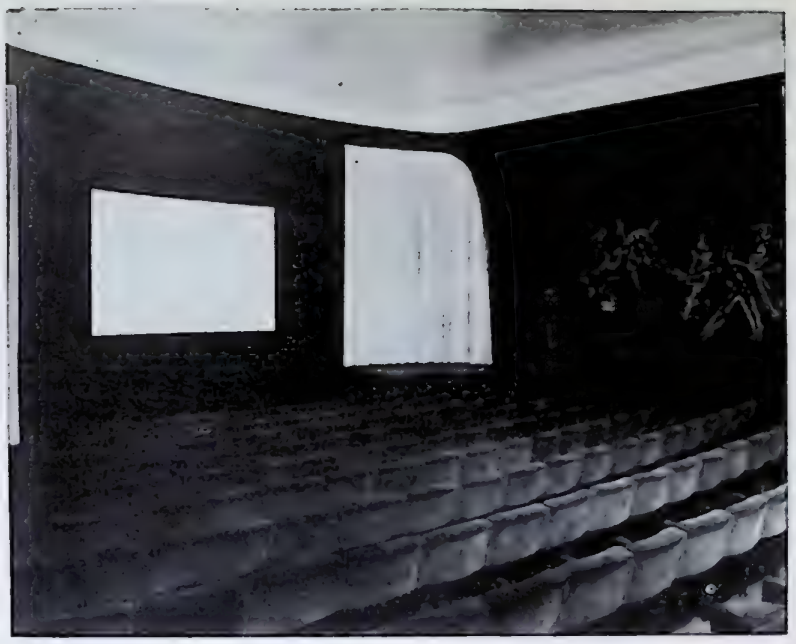
In the center of Rome, in the well-known Via Settembre, there is a large modern building called "Palazzo di Vetro" which means "The Glass Palace." With the exception of the concrete structure all the external walls are made of glass. The building is occupied by the CIM General Stores, somewhat similar to Macys in New York. Under the level



ONE of the best new theatres in Germany is the Elysee, in Aachen. This theatre is completely equipped with air-conditioning, and can play CinemaScope with full stereophonic sound.

floor of the Palazzo di Vetro, there is the Capitol Theatre of 1100 seats. The cinema is air-conditioned, acoustically-treated and very well decorated. The sound equipment is Westrex with Century projectors, Ashcraft hydro arc lamps and Bausch & Lomb lenses. The Capitol was the first theatre in Continental Europe to convert to stereophonic sound as the inauguration of "The Robe" took place on November 27, 1953. The Astrolite screen is 45 feet wide.

On the sixth floor of the same building there is the Arcobaleno Theatre, very popular with the American colony in Rome. It is a small 250-seat house where only original version pictures are shown. (In Italy all foreign language films are dubbed into Italian.) The sound equipment is Westrex Advanced with Century projectors and Ashcraft arc lamps. On the same floor there is a beautifully





decorated tea-room with a separate room for playing bridge.

ENGLAND

New worlds of hope for constructors and suppliers of furnishings and equipment have been opened by the Government's policy of relaxing restrictions on general building. Encouraged by the expectation of permits, as well as by the availability of materials and more specialized requirements, the two major cinema groups have already given a lead by announcing programs which involve not only the completion of projects left unfinished by the war but also the erection of theatres in situations first earmarked for he purpose many years ago.

Although for 14 years and more cinema architects in this country have had little or no opportunity to practice their arts, in some more fortunate lands building has continued undisturbed. In the United States new houses have come along steadily, but without any significant change. In Latin America, in parts of Europe which escaped the penalties of war, and in places where free supplies



THE STUDIO, in Dusseldorf, has among its unusual features a bar that is equipped with its own stereophonic sound system, enabling patrons to see and to hear the program while at the bar.

of steel, bricks, timber and other build-material have made life relatively easy for planners and builders, many fine theatres have emerged. Apart from local and traditional influences, the pattern has shown little, if any, variation.

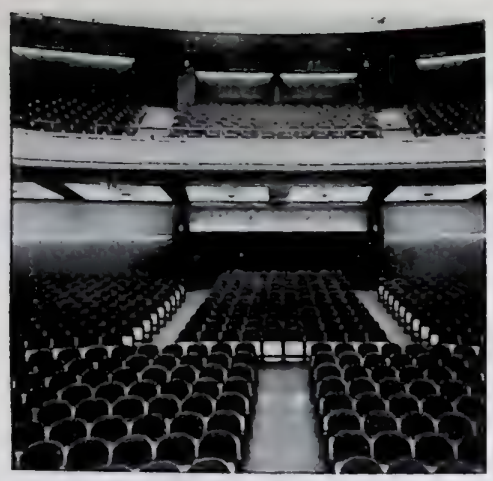
From Cairo to Calcutta, from Portugal to Panama, the main standards of cinema design, even in the newest structures, vary hardly at all from those of the Odeon or the Empire in Leicester Square, London. Yet one of these was completed in 1928, the other barely 10 years later.

There has more recently, been a considerable revolution in methods of presentation. 3-D for its best use called for four projectors where hitherto two have served. CinemaScope has required structural alterations to prosceniums, sometimes to auditoriums; many theatres have been ruled unsuitable to adopt it at all. Stereophonic sound has presented new problems of acoustics as well as others of a more physical nature. Only VistaVision has, so far, failed to make any demand on the theatre itself.

Will these influence trends? Will Cinerama, which has required exhibitors to tear seats out of their theatres literally







in hundreds, to scrap their entire projection systems and erect a series of booths inside the auditorium itself, to install amplifiers by the dozen and to introduce equipment such as picture and sound control monitors of which nobody had even thought before — will this potentially overwhelming form of entertainment give designers new headaches?

Not at the moment, it seems. Building of the immediate future is likely to introduce few modifications other than, perhaps, to express itself in widened proscenium openings fashioned to receive screens twice the conventional width and over. Such change as will be discernible is more likely to take the form of simplicity in place of ornateness, moderate capacity auditoriums rather than vast arenas. Consideration of price will be the influencing factor—and the threatening revised Home Office regulations may induce minor adjustments. But these are all. The real "cinema of the future" has yet to come.

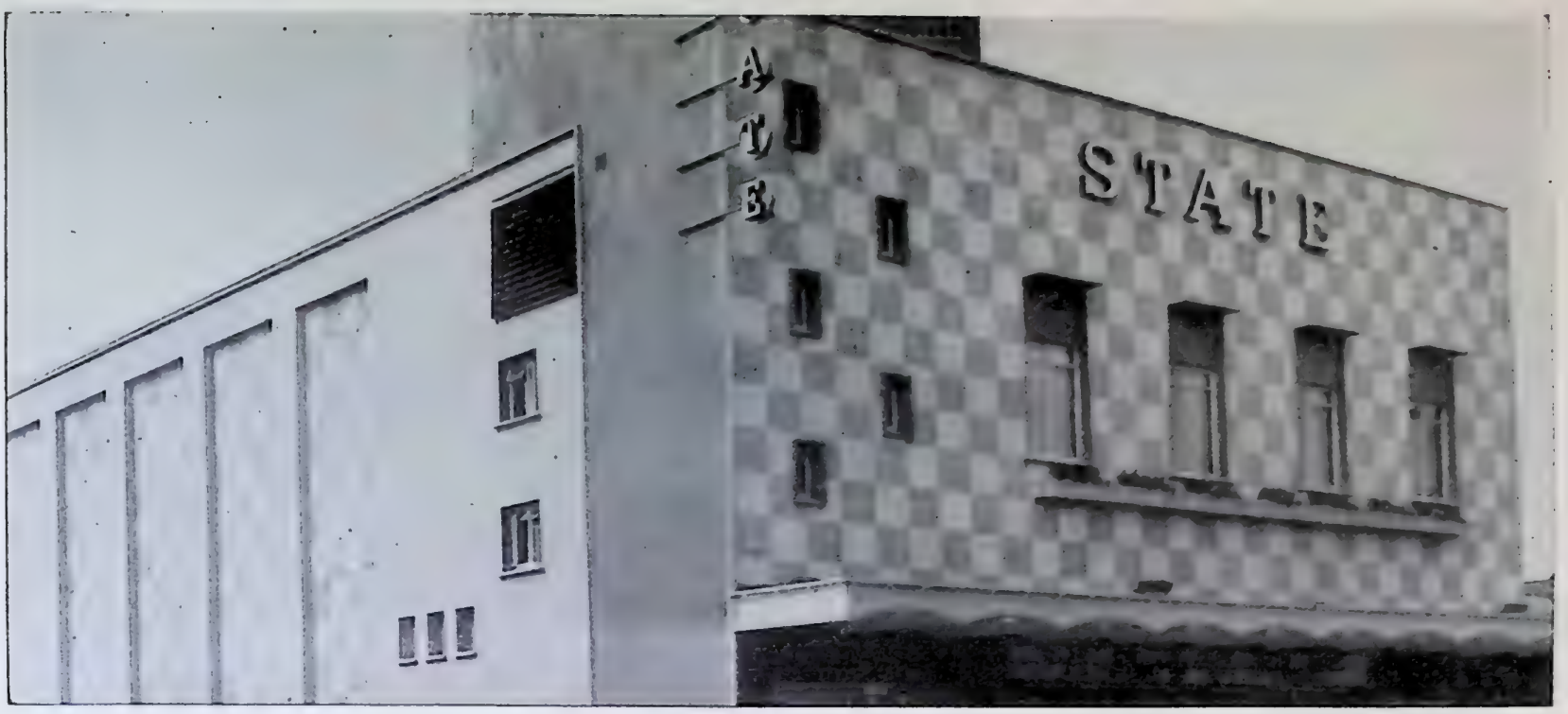
The promise of the immediate months or years ahead would appear to be economy in design. Cost of labor, material and equipment have, as goes without saying, risen since pre-war days out of all belief. Then, the price standard of an average-to-good cinema came out at about £23 per seat. Today it is nearer £60. Operating costs have gone up even





ONE OF the most recent additions to Italy's motion picture theatres can be seen in the city of Palermo. The Astoria is a first-class theatre and has 800 seats. Although the exterior has been kept rather plain, as can be seen by these photographs, the interior treatment is very attractive.





FEATURING a wide screen the New State Theatre, Phisboro, Ireland, is one of the few new theatres constructed in Great Britain recently.

Although there are few frills either on the exterior or interior, the very simplicity of the design helps to concentrate the attention on the screen.

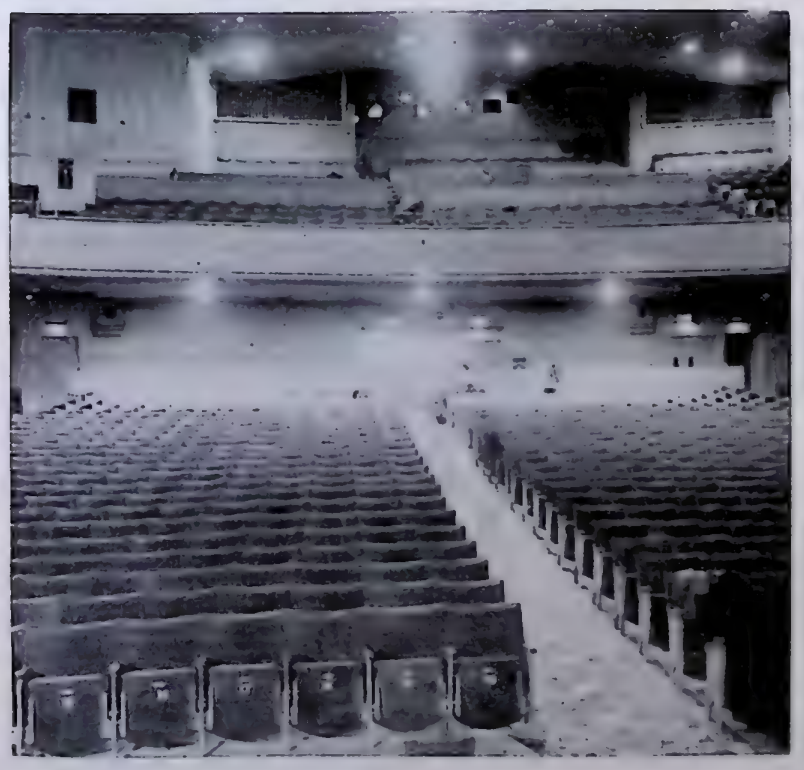
more. Cinemas which in 1939 could afford the luxury of empty seats can no longer do so. Indeed, the financial anxieties of many exhibitors in 1954 may well be traceable to this cause—that their cinemas were designed in more spacious times.

These cinemas, then, which may be going up in towns and districts that require them, what will be their style? They will be simple in design, with a functional, if not an austere, air about them. They may be the better for it, may prove more satisfying for their purpose than some of the more pretentious edifices which survive from yesterday. They will have comfort and amenities equal to the best that the most pampered patrons know; for the furnishings and trimmings of the cinema, the seats, drapes, lights, the soundheads and projectors, these have advanced even while they have become more costly. The emphasis, in fact, may well be laid entirely on expert presentation of the entertainment in a homely, cosy atmosphere. That in many instances there may be wide screens, stereo soundheads, integrators, anamorphic lenses and other of the most modern refinements to be allowed for on the bill will necessarily limit the expenditure available for fal-lals or decorative extravagances.

Many of these cinemas of tomorrow may be moderate in size. The economics of the present time teach that, while a patron turned away from a full house costs the exhibitor nothing, a seat representing a contribution of £60 towards the total outlay and which remains empty can point the way to disaster. A 1200-seater filled to capacity once a day is a safer bet than a "super" twice its size which continues doggedly half full. The exhibitor who builds, or rebuilds, must cut his coat according to the cloth of today.

ACKNOWLEDGEMENT

The editors of THEATRE CATALOG would like to thank Mr. Fortunat Baronat of Universal International Films, Inc., and his fine world-wide staff, for furnishing most of the photographs and material used in this article. Our thanks is also extended to Dr. John G. Frayne, of the Westrex Corporation, and Mr. Bernard Charman, of the Daily Film Renter, London, England. Without their generous cooperation this article would never have been possible.





Theatre Construction in Japan

A Complete Survey of the Motion Picture Theatre Construction Activities and General Industry Conditions in Post-War Japan

By Michiro Tomono
Chief Architect, Takenaka Komuten Co., Ltd.

BRIEF: *The story of the rebuilding of the Japanese motion picture industry . . . which had been almost completely wiped out during World War II . . . offers a revealing study of the progress that has been made in that country during its post-war period.*

This article . . . which was written by one of the leading theatre architects in Japan . . . indicates the great appeal that films have for the average Japanese . . . There are valuable discussions of early post-war conditions in the theatres . . . the impact of television . . . film production facts and figures . . . the role of the new projection and sound techniques . . . as well as details about the many new . . . and exciting theatres that have been constructed in the past two years.

As will be readily seen by the illustrations that accompany this article . . . the new theatres that have been erected in Japan's leading cities . . . are the last word in modern design . . . and combine the qualities of western thinking with that of the oriental to produce structures of individual and unusual beauty.

There is much here that will be of interest and value to all who are in the motion picture industry.

At the present time it is safe to say that motion pictures are, by far, the most popular mass entertainment form in Japan. An indication of the popularity of motion pictures in this country can be gotten by paying a visit to "Asakusa," a park located in the low-lying section of metropolitan Tokyo. In the park compound there is a place called the Rokku District, and it is lined on both sides of the street by approximately 20 theatres.

Theatre activity there begins as early as eight in the morning with the maintenance crews cleaning the interiors and washing the fronts in preparation for the day's business. The doors are opened at 10 o'clock and continuous performances are presented until 10 in the evening. There is a very good chance that you could enter any of the theatres in the Rokku District, at any time of the day, and find them filled to capacity.

Statistics bear out the fact that going to the movies is the number one recreational activity in Japan. The following figures were obtained from the 1953 census, and compares motion pictures with other forms of entertainment:

Motion Pictures	68.6%
Music	34.1%
Baseball	22.0%
"Kabuki"	17.3%
Variety Shows	13.2%

Attendance

During the year of 1953 the average Japanese saw a total of nine movie shows, and it has been estimated that the income from theatre performances was approximately 125 million dollars. This figure is said to be the highest since the termination of the war, and it is about 20 per cent higher than the gross of the previous year. Of course, when this is compared with motion picture theatre attendance in the United States, which averages 22 shows per person a year, the Japanese figure is not too impressive. However, when it is realized that the average annual income in Japan is only $160, and at least 45 per cent of this must be spent on food and shelter, it can be seen that the Japanese theatre attendance is actually quite high.

Most theatre people in Japan believe that if admissions could be lowered, there would be a decided rise in attendance. A look at the high rate of amusement taxes will quickly reveal the problem which faces Japanese exhibitors. From the year 1946, when the theatre business was revived, through to March 1950, the movie patron had to pay an amusement tax of 150 per cent. After a great deal of public and industry effort the tax was lowered to 100 per cent, and in January of 1953 the amusement tax was again lowered to 50 per cent. Today, in the first-run theatres in Tokyo, the general admission is about 50 cents, while in the second-run houses the admission price is about 30 cents.



THE ROKKU District, in Tokyo, is the site of some 20 theatres. Opening in the morning these theatres are filled to capacity the entire day.



ONE of Japan's outstanding new theatres is the Shibuya Daiei, in Tokyo. The facade is simple and ultra-modern, with impressive neon signs.

Television

Although television is considered to be a major competitor in the United States, it does not create much of a problem in Japan as television is still in the infant stage. At the present time it costs about $400 to purchase a TV set. When it is remembered that the average yearly income in Japan is only $160, it can be seen that there would not be a strong demand by the great mass of the population. Currently the ratio of set ownership is one set to every 2,500 persons. Even the most optimistic reports indicate that in 1956 the ratio will only be one set per 600 persons. This is far from the one to three ratio found in the United States. For this reason, in Japan the theatre is one of the most influential entertainment mediums, and for the time being, it is considered that this condition will prevail into the foreseeable future.

Production

The Japanese motion picture industry has been improving and advancing quite rapidly in recent years. One of the highlights of this progress was the entry of "Rashomon," produced by the Daiei Motion Picture Production Company, in the 12th International Film Festival at Venice, in August of 1951. The awarding of the Grand Prize to this film was a great achievement for the Japanese motion picture industry, and one which brought international recognition and notice to Japan's film industry. It also had the effect of giving this nation's film makers great pride and encouragement.

From the motion picture production point of view, at present there are five large production companies in Japan, and during the year 1953 they produced a total of 302 pictures. This represents the highest post-war production figure, and a 10 per cent increase over the previous year.

The following offers proof of the steadily increasing number of pictures made in Japan since 1948:

Year	*Number of Films Produced*
1948	123
1949	156
1950	215
1951	252
1952	278
1953	302

Foreign Films

In regards to foreign films after the war, the Allied Forces permitted nine American motion picture production companies to establish a film distribution center in Japan, as one of the Army's cultural facilities known as "Central Motion Picture Exchange," and through this channel American films were imported for use by the general public.

Similarly, in 1947 English films were imported through the English Film Distribution Corporation. In addition, the French Film Exporting Association, the Russo-Japanese Film Company and other foreign film representatives, were established in Japan.

At the present time American films make up about 70 per cent of the entire foreign film import, and the ratio of Japanese to foreign films is about six to four.

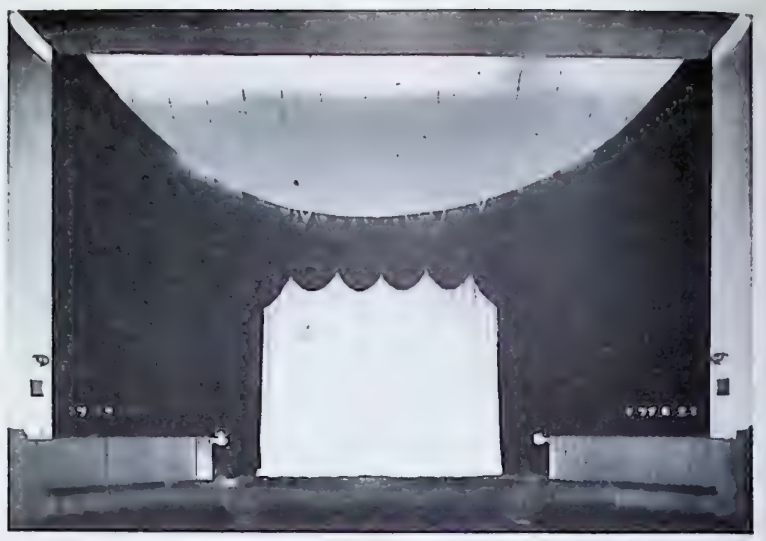
NUMBER OF RELEASED FOREIGN FILMS

Country	*1949*	*1950*	*1951*	*1952*	*1953*
American	90	133	143	151	144
France	32	22	9	9	3
England	23	19	13	13	15
U.S.S.R.	3	3	3	3	2
Italy	2	5	6	6	7
Others	1	3	13	13	14
TOTAL	151	185	187	195	195



IN this close-up of the facade it is possible to see some of the fine details that went into its construction. Mosaic tiles were used.





THIS VIEW of the Shibuya Daiei auditorium (above, left) shows the location of the projection booths which makes it possible to have a projection angle of 0. The stage (above, right) is beautifully draped, and the entire auditorium has been designed for perfect acoustics. Stairway to second floor (below).

Although the number of foreign films that are released to the public has been increasing, there appears to be no indication that it is seriously cutting into the income of domestic product. This is borne out by the fact that there are a number of large independent motion picture distributors in Japan besides the big five, and each one of these independents has shown approximately a 15 per cent increase in income for the second half of 1953, as compared with the first two quarters.

THEATRE CONSTRUCTION

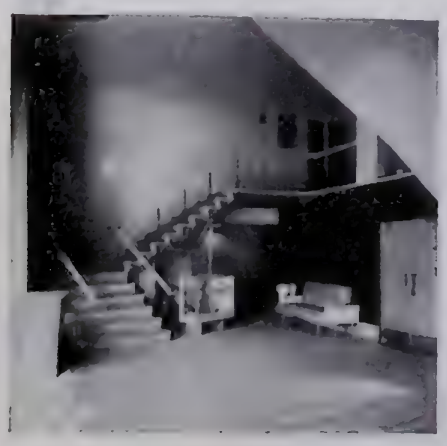
The theatre situation in Japan has been steadily improving since 1950, with a large number of new theatres being constructed, and others being extensively remodeled. In 1950 there were 2,400 theatres in Japan. At the end of 1953 there were better than 4,000 theatres in operation. If the population of Japan is estimated at about 83 million, the ratio would be roughly one theatre to every 20,000 persons.

Reason For Increase

One of the reasons for this increase was that the Construction Restriction Act was lifted and it was possible to get a construction permit without any difficulty. Another reason was the result of a Japanese market boom due to the after effects of the trade accompanying the Korean conflict.

Saturation Point

When compared to the American ratio of one theatre to every 9,000 persons,



THE foyer of the Shibuya Daiei is well designed for simple entrance and exit of theatre crowds.





THE SHOCHIKU Theatre, in Yokohama, was built to show only domestic films, and therefore a true Japanese atmosphere was desired. Walls of lobby are illustrated with interesting signs that attract.





the Japanese figure of one theatre for every 20,000 persons seems to indicate that there is still a substantial theatre shortage. However, when we consider the income of the general public in Japan, and the proportion of that amount which can be used for amusement, it can be seen that the current ratio may be nearer to the saturation point than appears apparent at first glance.

Nevertheless, new theatres are going up continuously, and in Tokyo alone, within the metropolitan area of six million population, about 20 new theatres were built in 1953.

Value of Theatres to Public

For a short period immediately following the end of World War II, the people of Japan were in a state of shock, and unable to think or make plans for the future. As with all things, the passage of time caused bitter memories to fade, and the people gradually began regaining their composure. The world was completely changed from long established customs, which put a great strain on the average Japanese.

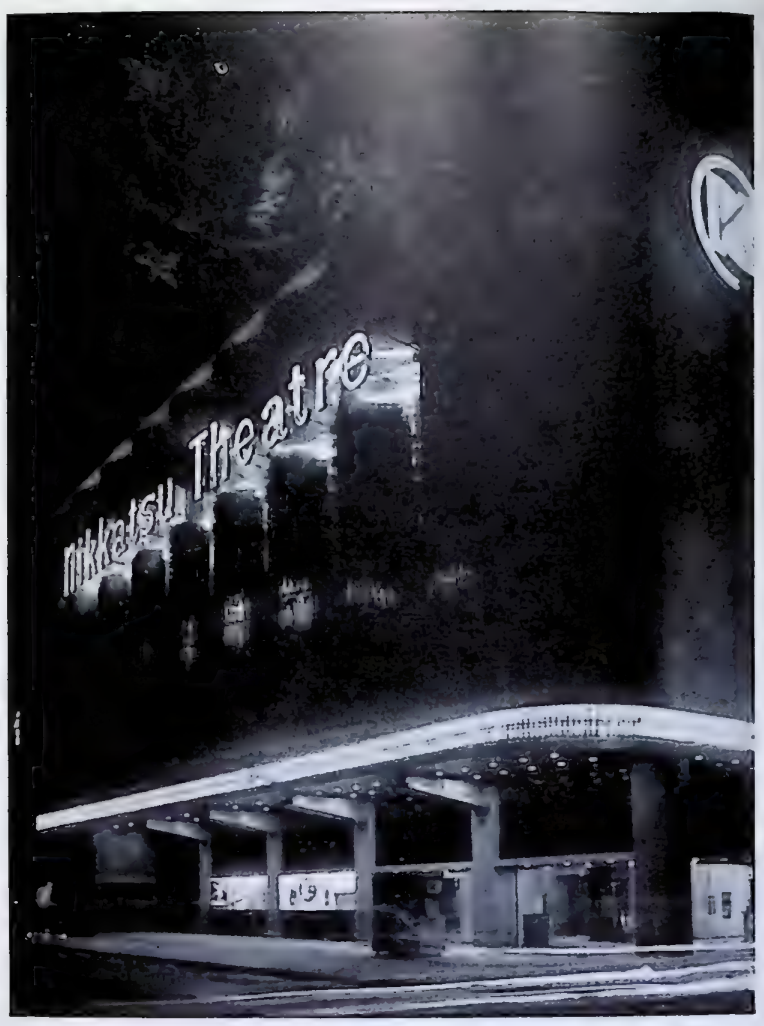
It is fair to say that the motion picture industry did much to help relieve the tensions of the public. Going to see motion pictures offered a release, and enabled the mind to relax, and begin to think of building a new life in the new post-war Japan.

The films also performed another valuable service. It was only natural that there was a great deal of bias towards America and Americans. Through the C.M.P.E. it became possible for the Japanese to see American films for the first time since 1941. These films did much to help restore a friendly and constructive attitude toward the United States, and its people.

Post-War Theatre Conditions

Theatres during the early post-war period usually had their exteriors badly





scorched and damaged as the result of bombings and fires. However, their condition was no worse than most of the other buildings, and therefore, the people were satisfied if they could merely get in and see the show.

Since the movies were about the only form of entertainment available to them, the people flocked to the theatres despite the primitive conditions. Wooden benches, such as those used in parks, were set up in rows on dirt floors. When the seating capacity was reached people started to overflow into the aisles and exits, obstructing the view of those in back seats, who in turn started to stand up in order to obtain a better view. This would usually result in a great milling mass of humanity, all striving to get a better position in which to watch the screen.

The patrons were usually so engrossed by the action of the film that they did not pay much attention to conditions about them. At times the benches would break and someone would be injured. In spite of all these things, the theatres continued to draw capacity crowds.

With the passage of time there have been great strides made toward restoration. Provisions can be found in stores in greater quantities, better quality clothing can be seen in the streets, and many new buildings are being erected. The same condition has held true for the construction of theatres, changing their appearance with the trend toward modernity. Therefore, the primary tasks of theatres, to supply comfort and safety, are being pursued in this new era of Japan.

STAIRWAY leading to balcony (above, left) has a truly Oriental flavor. This is also the case in main lobby (below). Another imposing new theatre (above, right) is Nikkatsu, in Tokyo.



Construction Considerations

In making plans for the new theatres one of the first things that was given serious attention was good viewing from all seats. Research on sight-lines had been going on for 20 years, and the principles of proper viewing angles in the auditorium were well established. The only limitation was the problem of keeping construction costs within the available amount of money, without jeopardizing the seating capacity needed for successful operation.

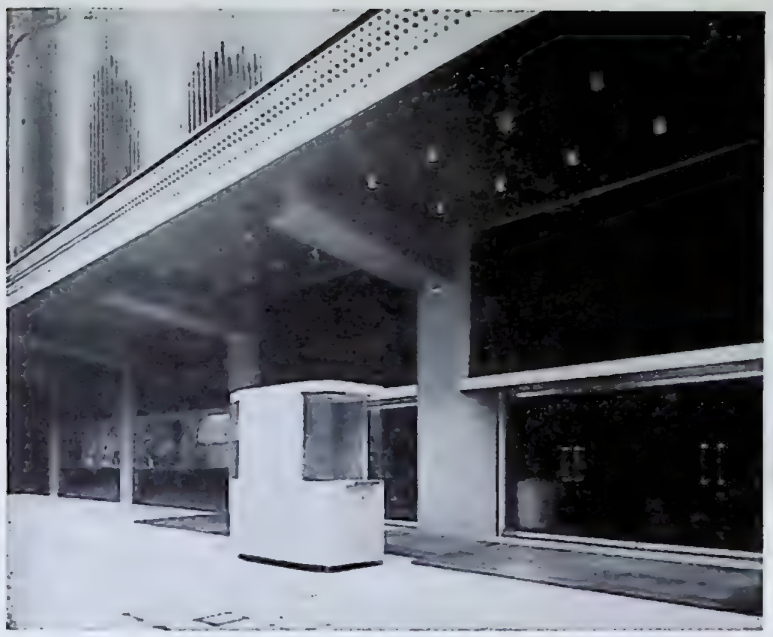
As with sight-lines, the acoustic theory was reasonably advanced before the war, and the method of its application was well understood. The major problem was the lack of needed acoustical materials, and only recently the much desired materials have been made available at less than prohibitive prices.

In the early stage, the sound absorbent materials were manufactured from some sort of compressed fibre, or texboard. These materials had substantial sound absorbing qualities, although they were inferior in appearance, and varied in thickness, resulting in poorly finished surfaces.

At the present time conditions are greatly improved. The acoustic materials now manufactured in Japan are considered to be the equal of anything produced in the United States. In addition a new acoustical plan designed to absorb both low and high sounds by proper application of various types of sound-absorbing materials, has proved to be practical, and good results have been obtained.

Seating Capacity

Today, the average theatre in Japan must have a seating capacity of at least 600, or else it can not be operated at a profit, according to the theatre operators. If we take an average of all the theatres in Japan, the seating capacity is approximately 500 seats per theatre. However, if we omit the newsreel theatres, the average drops to 300 seats. Houses with a seating capacity of over 1,500 seats make up less than one per



A VIEW of the front entrance of the Marunouchi Nikkatsu Theatre. Made of aluminum, the boxoffice is moveable, and can be stored when it is not needed.



THE CURVING facade was coastructed by making use of a unique concrete pouring process. Gray tiles and a red and black plastic spray finish were used.

cent of the total of theatres in Japan. The largest theatres hold about 3,700 persons.

It has been found that theatres with a seating capacity between 500 and 1,000, have little difficulty with sightlines or acoustics. Therefore, most exhibitors concentrate on getting a greater seating capacity at a nominal cost, and still be able to build a theatre that will attract the public.

In Tokyo, today, it is considered that a figure of $200 per seat, including such things as air conditioning equipment, furniture, rugs, electrical fixtures, etc., can be considered a fair cost for the construction of a new theatre in the general amusement centers. For instance, if a theatre with a 1,000 seat capacity can be constructed at a cost of $200,000, it is considered to be economically sound. Naturally, the cost of the land is not included in this cost. In general a construction cost of $10 to $12 per square foot is considered necessary. Therefore, if a theatre can be built in an area of 18,000 square feeth, rather than 20,000 square feet, it is possible to build a better theatre by utilizing that extra two dollars a square foot on such things as furnishings and equipment. In Japan construction costs are estimated by the floor area.



THE wooden walls of the basement lounge (above) are tastefully designed. The first floor lobby uses light and heavy masses for a pleasing effect.

Seat Sizes

By constantly studying and working the Japanese theatre design has been improved day by day. However, it is only recently that theatre operators realized that it was not always the wisest thing to merely install more seats in an effort to increase income. It took





A FULLY equipped bar (above) is found on the second floor. The basement lounge (below, left) features a ceiling covered with silver paper. Entrance to rest rooms (below, right) art made of mosaic tiles.





THE SCREEN is 28 by 21 feet, but is designed to be replaced by a 64 by 25 foot screen for CinemaScope. The theatre seats 1511, and because of ground conditions, is one of the few houses in Japan to have carpets on all of the floors. The auditorium was designed to achieve the highest level of visibility.



many years before the Japanese exhibitor would even consider other seating plans to improve attendance.

The chair width was set at 16½ inches, with a back-to-back spacing of 31½ inches designated as a minimum plan under the Construction Regulations. This size was used for a long time, and there were no great complaints from the public. However, from the beginning this chair size was considered small and uncomfortable, and audiences were by no means satisfied with the seating conditions that were generally found in the nation's theatres.

As an experiment one of the recently constructed houses installed modern, and more comfortable seats. A number of seats had to be lost, but the sacrifice was made in order to furnish the audience with a greater degree of comfort while viewing the program. The results proved that this theatre had greater attendance than a similar theatre using the smaller sized chairs. From that time on the theatre equipped with the old style, small chair showed a marked decrease in attendance.

Today, it is the rule rather than the exception to manufacture chairs that are of a sufficient size to insure comfort. Newly constructed theatres are equipped with chairs of a 20 inch width, while the back-to-back spacing has been increased to 36 inches. The number of seats in each row permitted with this arrangement is 12 abreast. It has been proven that by limiting seating capacity to a size where the audience can enjoy the proceedings in comfort, it is possible to increase attendance to a much greater degree than by crowding too many people into an auditorium with small seats.

New Techniques

At the present time the Japanese theatre industry is looking into the problems of the wide screen, CinemaScope, and 3-D. The first CinemaScope picture was shown to the public in Tokyo and Osaka in 1953. The theatres in both cities installed 50 foot wide screens in order to show the film.

The newly constructed Nangai Theatre, in Osaka was selected for the first showing of CinemaScope in Japan. One of the interesting features of this theatre is its projection angle of 0 degrees. Since there is a tendency for greater distortion as the screen gets bigger, as is the case with CinemaScope, the smaller the projection angle the better.

The projection booth at the Nangai is built on the mezzanine floor. Projection booths are arranged in three different places on the same floor so that ordinary 2-D films may also be projected.

NEW THEATRES

The three theatres recently designed and constructed by Takenaka Komuten Company, Ltd., the "Marunouchi Nikkatsu," and "Shibuya Daiei" of Tokyo, and the Nangai in Osaka, all have their projection booths built under the balcony, and at the time of this writing, they have all obtained good results.

In 1954 three theatres in Tokyo, and one each in Nagoya, Kyoto, and Sendai opened for business after remodeling and conversion to CinemaScope equipment.





THE NANGAI Theatre, Osaka, was the first one in Japan to be constructed specifically for the showing of CinemaScope. The theatre is located in a building which houses two other theatres.

CinemaScope Equipment

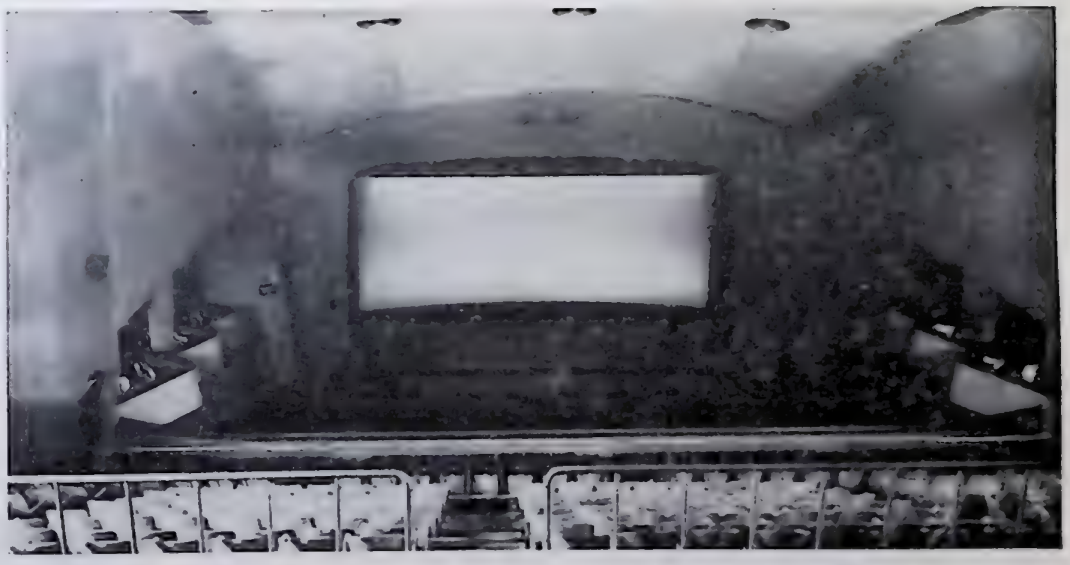
It is interesting to note that six months after the first demonstration of CinemaScope the first domestic set of CinemaScope equipment was produced by a Japanese firm. The all made in Japan equipment — the Royal stereoscope projector and the Royal stereoscope sound system—was introduced to the industry May, 1954.

The first theatre to be equipped with Japanese CinemaScope equipment was the Shinjuku, Shinjuku, Tokyo. This theatre was built by Kumagai Gumi, Ltd., in January, 1953, and designed to give stage performances for the drama, kabuki, and other plays. The theatre turned to motion pictures six months after it opened.

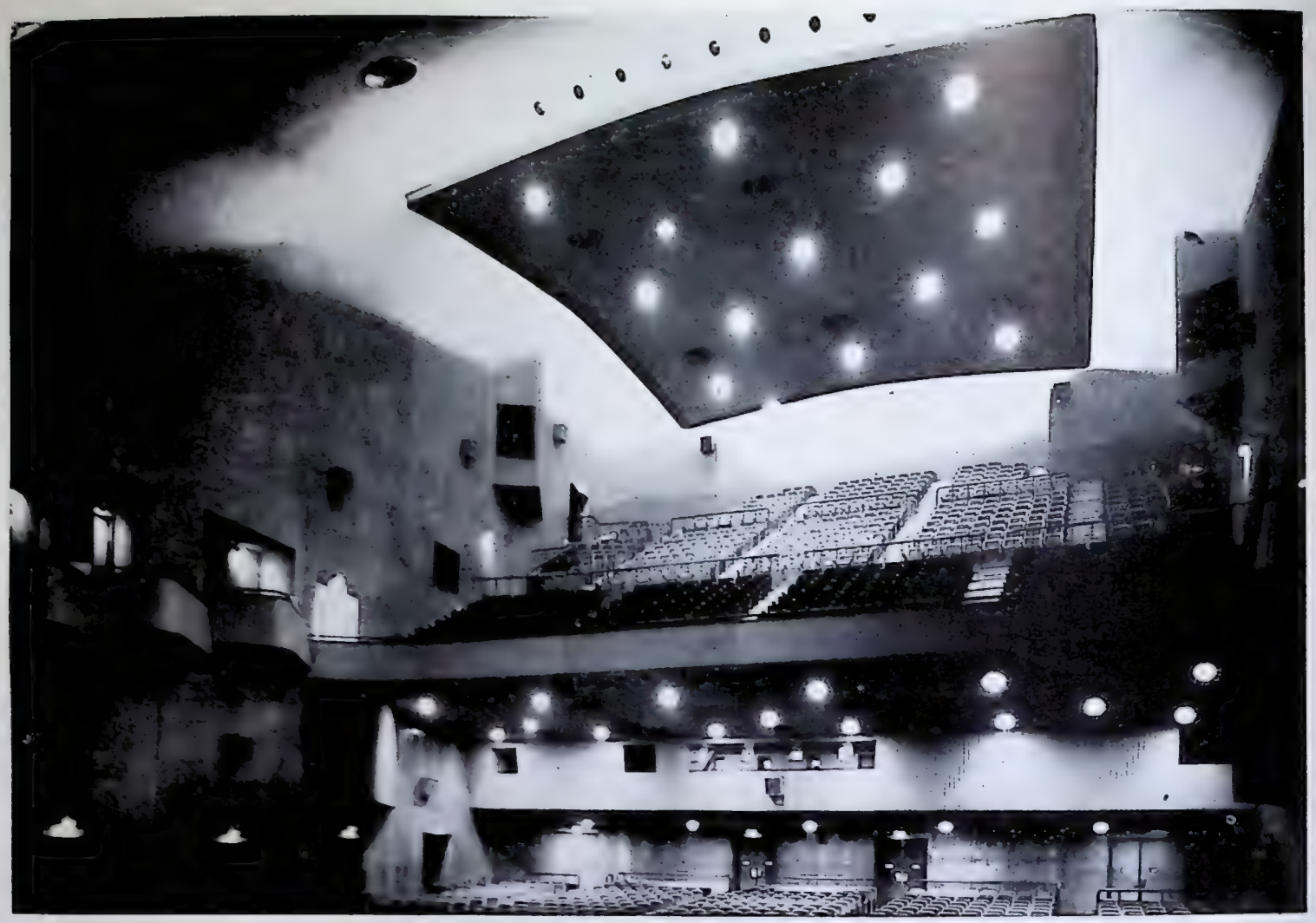
The equipment includes a stereophonic sound system with nine speakers on the stage and 11 in the auditorium. The screen is 49 feet by 18 feet. The total cost of the Japanese made CinemaScope equipment, including the projector, sound system, anamorphic lens, screen, rectifier, and booth remodeling, was about $42,000.

Theatres in Tokyo

In 1950 there were 175 theatres operating in the city of Tokyo. In 1954 the number of theatres had increased to 350. The great majority of these new houses were built in districts paralleling both sides of the interurban tram lines. These were the most logical sites as residential districts for the daily commuters who travelled into the center of the city. As the trend toward suburban centers grew, it was only











THE SPACIOUS and ultra-modern auditorium of the Nanzuki (above) is an indication of the strides made in theatre architecture. Featuring imposing pillars, the first and second floor lobbies (below) impress.

natural that the construction of new theatres increased in those areas.

Those theatres having a seating capacity of 500 or less were built at a comparatively low construction cost. In the downtown section, the large pre-war theatres renovated the damage sustained during the war, and operating as first run theatres, attracted most of the crowds.

In 1954, in Tokyo's civic center called the Marunouchi District, a new theatre, the Marunouchi Nikkatsu came into existence. The theatre was designed and constructed by Takenaka Komuten Company, Ltd., and has a seating capacity of 1,511 with a 65 foot wide stage. There is a fully equipped air conditioning system branching into four circuit systems functioning throughout the year, and maintaining pleasant air conditions in all parts of the building.

The interior walls of the auditorium are covered with a specially weaved orange colored fabric, while the ceiling is gracefully moulded in wavelike effects finished with asbestos plaster. Its acoustic effect is very satisfactory, as well as being pleasing to the eye.

The floor of the lobby was covered with a red carpet, and it is said to be the first and only theatre in Japan to have carpeted floors. The reason being that the condition of the streets are very poor and usually can not maintain the carpet in good condition in ordinary theatres. On the walls and ceilings of the lobby artistically designed lumber materials have been used, and a portion of the area contains Japanese pictures, creating an oriental atmosphere.

The projection room is located under the balcony, and there are reserve rooms on both sides for the projection of films other than CinemaScope. The exterior facade wall is built in a cantilever style, and in order to make it structually strong, its surface was given a curvature wavelike face, and over this surface a scarlet colored narrow strip of alumite sheet was vertically installed. Over this a neon sign spelling Nikkatsu Theatre, and ornamental fixtures are installed with a special neon light effect. This illumination sign letter design was awarded first prize for the year of 1954 by the Tokyo Neon Design Judge Committee.

The construction cost of this theatre is almost twice that which is needed to build the ordinary theatre, working out to an average of about $400 per seat. Despite this, the admission prices are 53 cents for the first floor orchestra seats, and 84 cents for the second floor balcony, which is reasonable compared with that of any ordinary first-run theatre in the city.

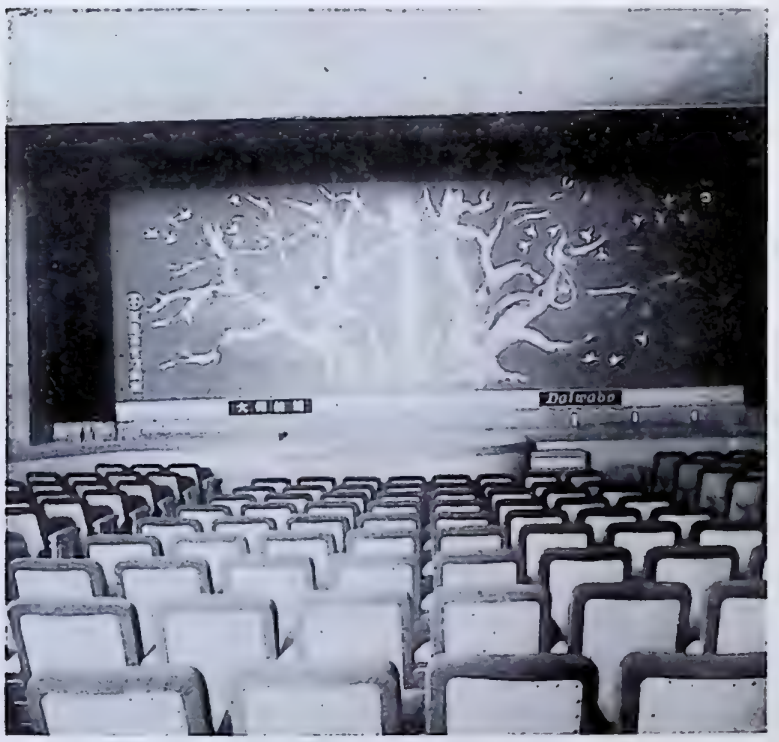
In the western section of downtown Tokyo there is a ward known as Shibuya. In its amusement center there are two theatres which have been built since the end of the war, and should be given some attention. One of them is the Shibuya Daiei, designed and constructed by Takenaka Komuten Company, Ltd., completed in 1953 with a seating capacity of 1,000. Its construction cost was approximately $200 per seat.

The principal feature of this theatre is that it was most logically designed within the sphere of allowable construction laws and regulations. And the simplicity of the modern facade, tiled with sky-blue mosaic tiles, has drawn quite a bit of public recognition.

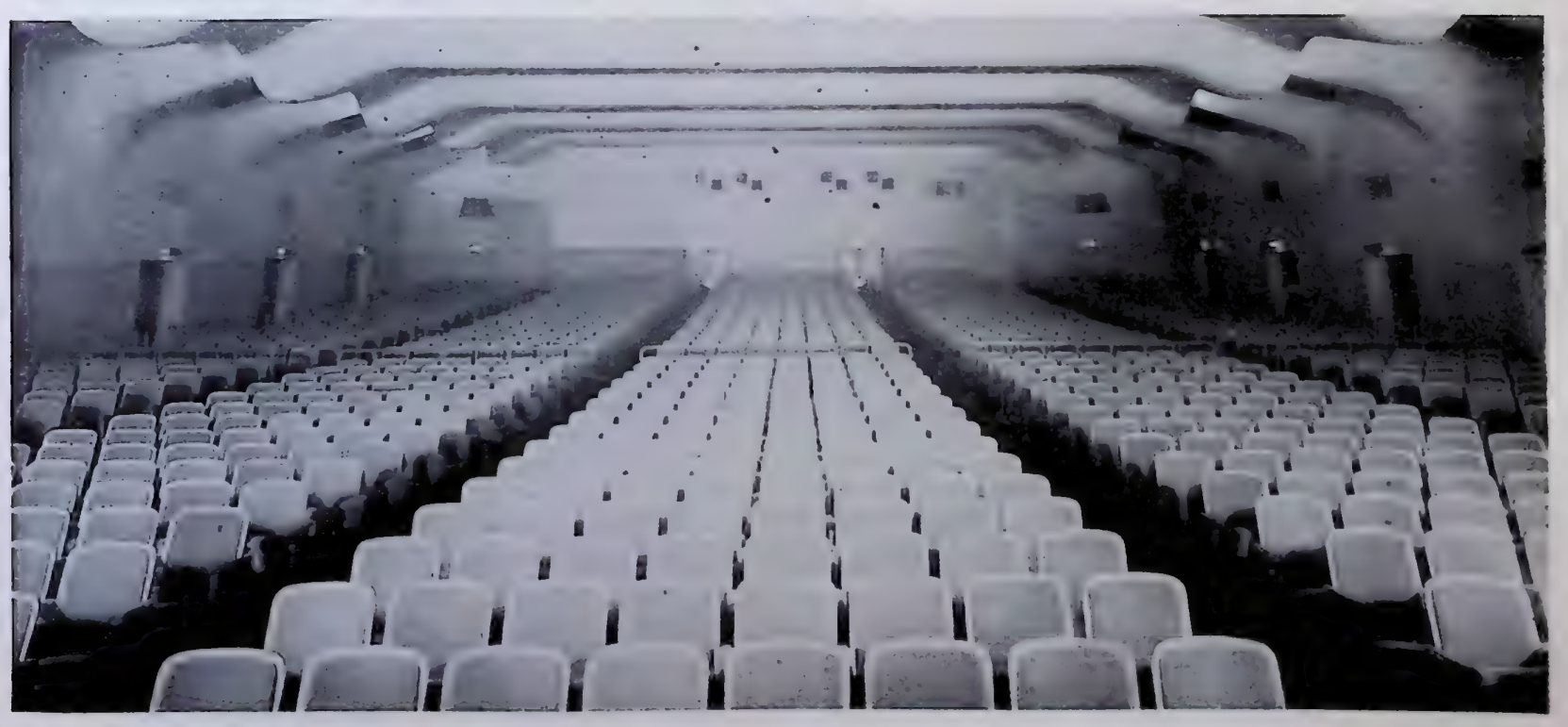
The other theatre in this section is the Shibuya Toei, which was designed



LOCATED in the same building as the Nangai are two more theatres. The third floor holds the Music Hall for live performances, and a basement theatre is fully equipped with 1200 seats.





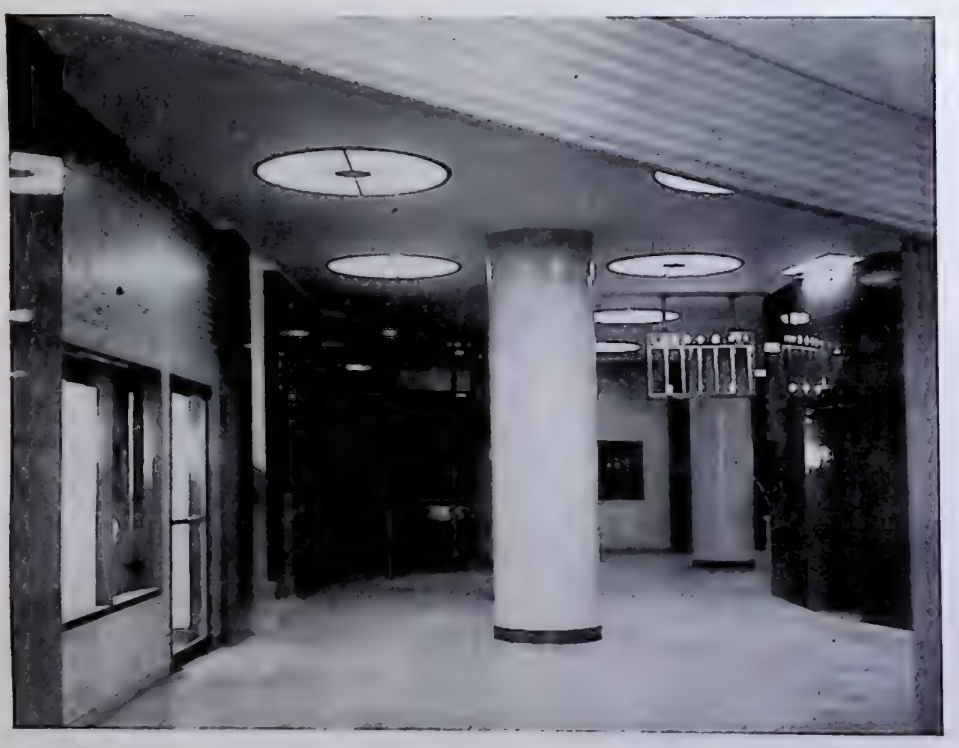




by the G. Kume Architect Office, and was completed in 1953 by the same construction company that built the Daiei. This theatre is composed of two auditoriums, each on separate floors. The above ground auditorium consists of 900 seats, while the one in the basement can hold 420 persons in its auditorium area. Its modern up-to-date appearance is one of the outstanding features of this theatre. Despite the large number of seats, and the large, impressive lobby and lounge areas, this theatre was built in a rather small land area.

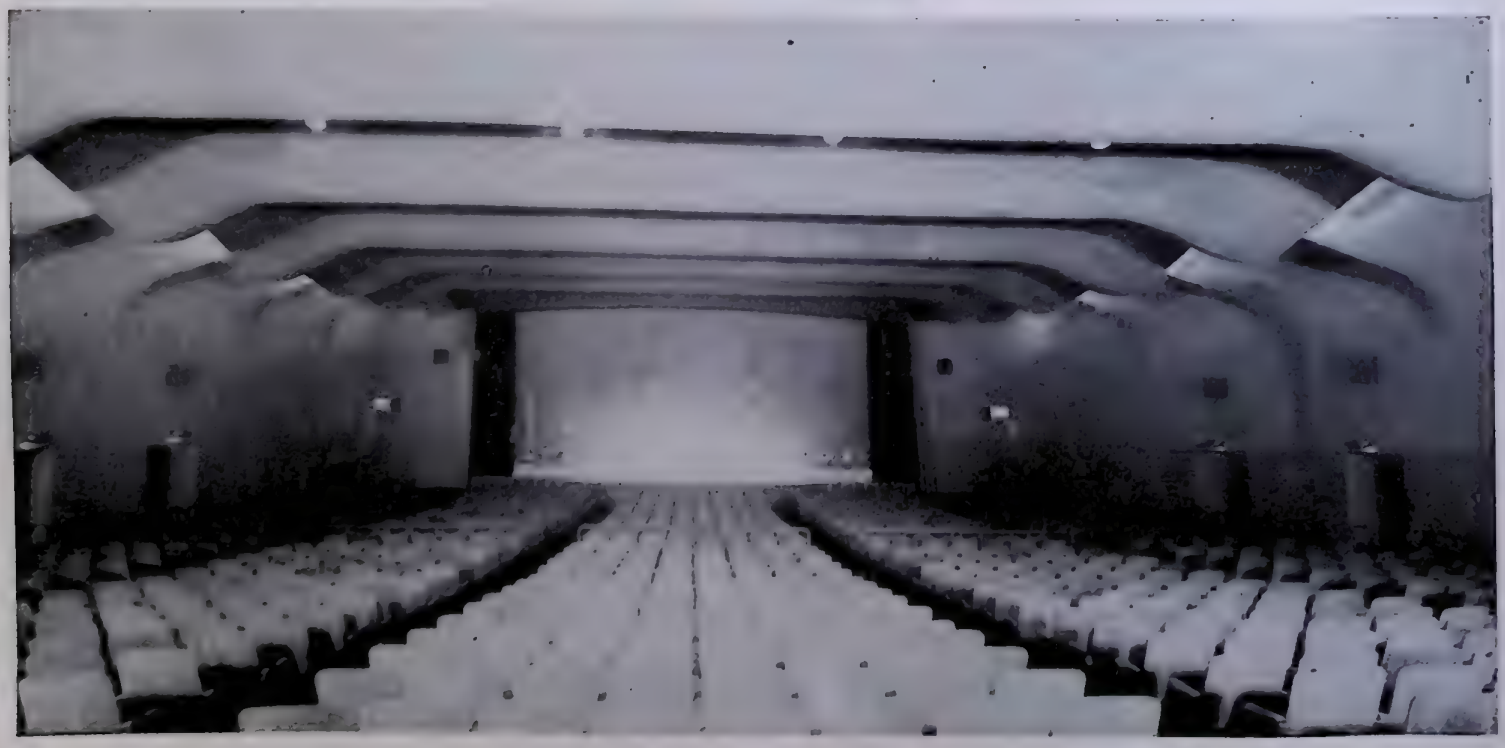
Yokohama

The city of Yokohama, in the pre-war period, was the leading trade port of Japan, and it enjoyed many prosperous years. However, like Tokyo, the entire city was almost destroyed by the war. Although it has not quite matched the pace set by Tokyo, the rehabilitation





SEEN on this page are additional views of the motion picture theatre found in the basement of the Nangai building. It is primarily used for showing newsreel programs, and shorts.



program has been making great strides towards restoring the city to its former appearance and prominence.

One of the outstanding new theatres of Japan was constructed in the downtown section of Yokohama in 1954. The theatre, called the "Yokohama Shochiku," was designed by Takeo Amito. It has a seating capacity of 1,074, and has a stadium type auditorium, which has been so designed that a wide-screen may be installed with little difficulty.

The color scheme is white, blue and brown, similar to that of the main color pattern used in Japan's Kabuki theatres. The lobby of the theatre boasts an original abstract mural painting by Keisuke Yamamoto, and helps to create a true Japanese atmosphere. This mural is one of the outstanding features of the Shochiku.

Osaka

The city of Osaka has recently constructed theatres that are worthy of mention. They are the Grand Movie Theatre, designed by T. Murana, and the Nangai Theatre, which was discussed previously. Both of these theatres are located in southernmost section of the city.

The Grand Movie Theatre has a seating capacity of 1,200, and one of its features is that the main floor is sloped from the mezzanine floor toward the orchestra box on the first floor level. Patrons coming in from the main entrance go through the lobby and ramp directly to the central section of the auditorium. It has also been so designed that the theatre may be entered by way of the ramp to the main floor, and then to the rear section of the auditorium through the main lobby. According to this elevation plan, the floor of the auditorium at its lowest point right in front of the stage, is almost on the same level as the ground line.



SHORTLY after CinemaScope was introduced in Japan, work was begun on the manufacture of equipment by native firms, such as screen, anamorphic lens and stereophonic sound equipment seen here.

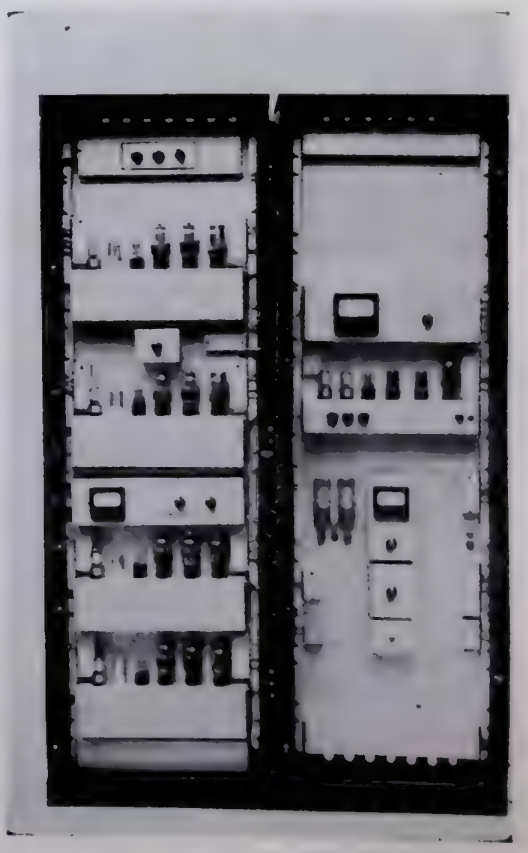
The decorative scheme of the auditorium includes narrow wooden strips, in diamond shapes, nailed to the ceiling and painted a dark blue color. The walls are white, and similar narrow wooden strips are vertically nailed on the sound absorbent materials across the wall, leaving space equivalent to the width of the strip between each section, and finished with light yellow paint. The draperies are maroon, and the chairs are covered with a dark yellow material.

The Nangai has its main auditorium on the first floor with a seating capacity of 1,554. On the first basement floor there is a 1,200 seat theatre, while on the third floor there is another auditorium holding 300 persons. These facilities make it possible to combine stage shows and motion pictures in one building. Its design and construction was done by Takenaka Komuten Company, Ltd., and was completed early in 1954. The Nangai had a construction cost of under $400 per seat, which is fairly low considering the fine facilities and equipment that have been provided.

ACKNOWLEDGEMENT

The author would like to thank the following for their cooperation in furnishing information used in this article: K. Ogino, Sales Manager of Nihon Eiga Shizai Company, Ltd.; Messers Shimizu and Compal, editors of the Kenchiku-Bunka; T. Kamimura, editor of the Tokyo Press; M. Hasegawa, editor of the Kinema-Jumpo; and the Jiji Press.





The Cinema: A Model Theatre

Small Canadian Town Can Boast of Its New Theatre Equipped To Show All of the Latest Projection and Sound Techniques

BRIEF: *Located in western Canada . . . which has not seen much theatre construction in the past few years . . . the recently opened Cinema . . . in Swift Current . . . Saskatchewan . . . is probably the most modern house in that part of the country.*

The theatre is completely equipped to show CinemaScope . . . and other wide screen systems . . . as well as stereophonic sound . . . In addition to the latest and finest in projection and sound equipment . . . the theatre has been furnished and decorated with the newest and safest materials currently available . . . An interesting . . . and unusual feature of the Cinema . . . is the glass-enclosed Party Room which has been constructed . . . It is equipped with its own loudspeakers . . . and is available to groups who would like to have the luxury of a private theatre party . . . completely apart from the rest of the house . . . A Cry Room has been similarly equipped . . . This article gives a full description of this interesting theatre.

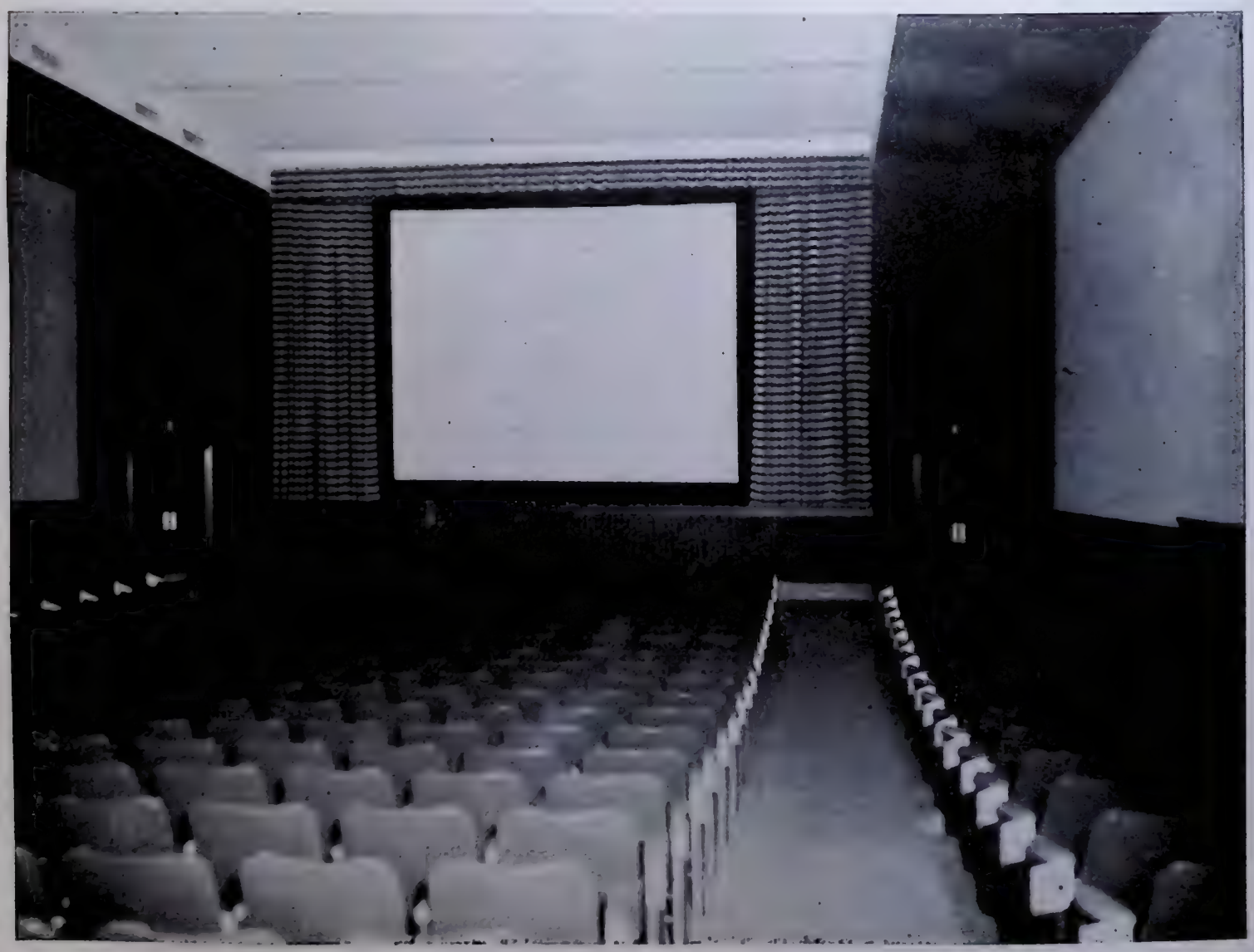
Built on a corner location, one block off the main downtown intersection, the Cinema is the newest addition to several recent structures of contemporary design to be constructed in Swift Current, Sask., Canada. Erected with a Roman brick and reinforced concrete construction, the building presents a pleasing appearance to both approaches, and provides easy access from any direction, as the main entrance and marquee faces on an angle to the corner. The marquee, built on the site, is equipped with a neon sign on either side, spelling the name "Cinema," and has Adler changeable program equipment on its front, which is readily seen from any approach. The name "Cinema" is also mounted on the building facade, over the marquee, and edge-lighted by neon.

On the west side of the building are plate glass windows which light the theatre office, upstairs offices, as well as a plate glass and aluminum door, providing access to the upstairs areas. Two sets of plate glass and aluminum double doors provide access to the entrance lobby, where an overhead unit, powered by a large fan, provides extra heating in the "cold zone" for the winter weather. To the left is the inside boxoffice, completely glass enclosed, and immediately adjacent to the candy and popcorn concession. A dominant feature of the lobby is a louvered floor to ceiling screen with a large planting box.

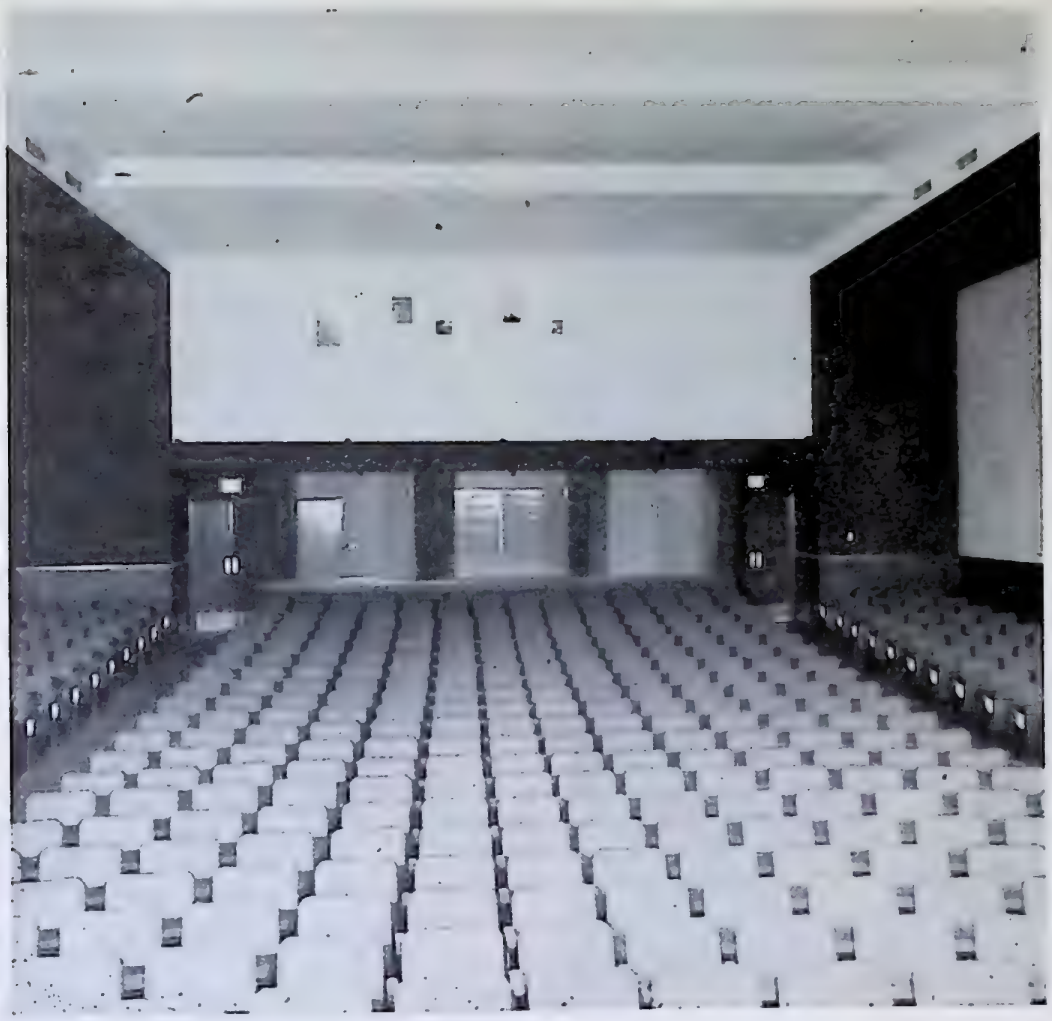
Interior

The floor of the lobby is of Jaspe linoleum tile, laid in an interesting design of three colors, dark brown field, grey stripes and large yellow squares, in a directional pattern.

An unusual aspect of the lobby is the wall covering. All areas are covered with "Fabron," a fire-resistant plastic coated fabric in a geometric pattern suited to this commercial interior. It is



THE AUDITORIUM floor is bowl shaped to ensure perfect viewing of the wide screen from any of the 460 seats. The floor is made of concrete.



THE COLOR scheme of the auditorium (above) is dark brown, yellow and white. The Party Room and Cry Room (below) are extra services given.

anticipated that the use of this wall covering will greatly reduce the maintenance of wall areas required, due to public abuse and accidental damage, which usually occurs on painted areas.

The Ladies' and Gentlemen's washrooms, equipped with the most up-to-date fittings, are located at opposite sides of the lobby, yet convenient to the auditorium doors. They are also provided with linoleum tile floors and Fabron wall covering in an interesting "textured" design.

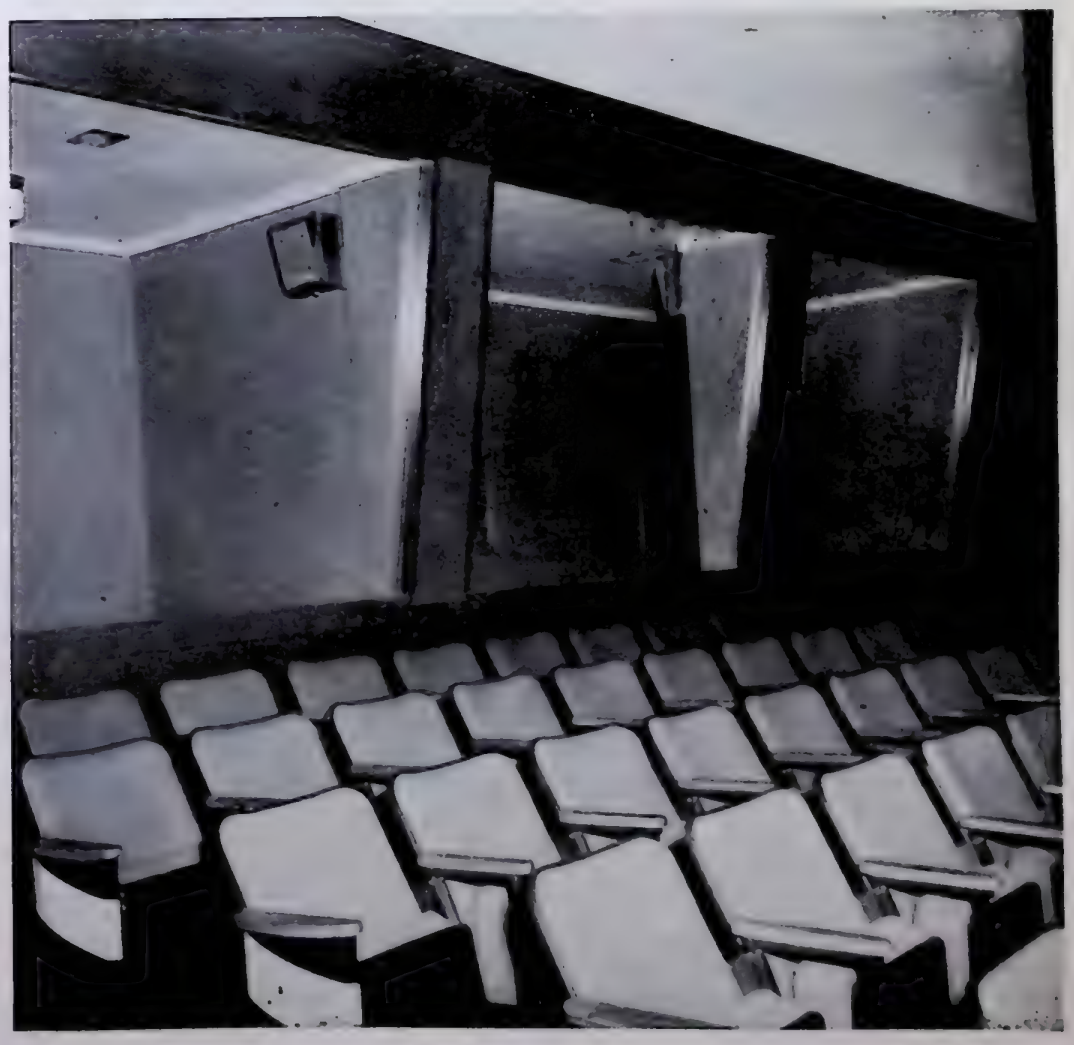
Opening off the lobby are the Party Room and Cry Room. The former is furnished with comfortable easy chairs, carpeted floor and attractively patterned wall covering, and is available to persons who may wish to attend the theatre in a group. It is expected that local business men, particularly, may take advantage of the facility. The Cry Room, similarily furnished, but with a linoleum floor covering, is provided for the convenience of parents attending with small children. Both rooms are divided from the main auditorium by soundproof plate glass windows, and equipped with loud speakers. A glass showcase, lighted top and bottom, for coming attractions is housed on the wall between the Party Room and lobby, and is accessible from the Party Room.

Auditorium

The main auditorium feature is the concrete parabolic floor. This floor is designed in a "bowl shape" to ensure perfect viewing of the screen from any seat in the house. The concrete was poured in two layers, the top coat one and a half inches thick, containing an integral green coloring agent which presents an attractive appearance, at all times.

Seating layout is in three sections — the main center section consisting of 22 rows of 14 seats each, the two side sections of 20 rows of four seats each. The aisles between the sections have been carpeted with a specially woven English carpet 36 inches wide, laid over one-quarter inch sponge rubber underlay, and recessed in a well formed in the concrete to the exact depth of the carpet. This type of installation eliminates the possibility of patrons tripping over the edge of the carpet and protects the carpet from damage to the edge. It also has a tendency to simplify the cleaning of the auditorium floor.

One of the most interesting and practical treatments in the auditorium is on the wainscoting. This wall area which is usually subjected to a great deal of abuse, has been covered with a vinyl plastic coated sailcloth, known as "Permon" which presents the appearance of mahogany pannelling. It is cemented with a special mildew-proof adhesive to plywood sheathing and topped by a decorative molding. It is felt that the extra cost of this material, which is also fire-resistant, will be more than met by the saving in the continuous maintenance usually required for this area. The side walls of the rough textured acoustic plaster, painted. Extending the full length of the auditorium, from front to back, is a soffit panelled in striated plywood, patterned in a large alternative square arrangement, and concealing the duct work of the air conditioning system.





THE THEATRE FRONT (above) is made of Roman brick and reinforced concrete. Building is located on a corner. The floor of the lobby (below) is of linoleum tile in three colors, brown grey and yellow.



The ceiling and back wall are covered with acoustic tile and lighting troughs run across the ceiling from side to side, at regular intervals. The side walls are provided with electrical outlets for decorative lighting panels, to be installed at a future date.

Two exit doors at the front of the auditorium, one on either side of the stage, permit patrons to leave the theatre by choice of routes and one, in particular, opening onto the street, is being exploited by the use of an additional illuminated sign over the door saying, "This Way." This sign is turned on only when the show is changing and, immediately, attracts the patrons' attention, eliminating considerable congestion in the lobby.

Stage

The design of the stage is such that it is not possible to use it for live shows, as the depth is not sufficient to provide for the screen and sound equipment, and the space required for a show of that type.

The owners, however, installed a curved CinemaScope screen 31½ feet wide by 15½ feet high. This screen is of the seamless, perforated plastic type. The arrangement of screen masking and curtains enables the management to change to any size of picture, at will, thus making for great adaptability in the manner of film presentation.

The high fidelity sound equipment is especially designed with two low frequency speakers for maximum fidelity of both sound track and recordings.

Stage curtaining was especially woven in a horizontal stripe design embodying the main auditorium and lobby colors, dark brown, yellow and white, with a wide band of lurex gold metallic thread.

Overall effect of the color scheme is warm and restful, while the main colors are balanced by the dark green of the seat finish and upholstery.

The seating is of the latest style with one piece steel back and seat pans, and natural finish wood arms. There is a maximum of leg room and a deep spring upholstered seat cushion.

Other Equipment

Ballantyne lighting, projection equipment and Lightmaster rectifiers, together with GoldE rewinds, have been combined with the Royal Soundmaster sound equipment to provide patrons with the most modern projection room equipment now available for the exhibition of standard and wide screen pictures. The projection booth is 10 by 20 feet which gives the operator ideal working conditions in pleasant surroundings.

Also on the upper level adjacent to the projection booth are two large offices for rental, and these can be reached through a separate entrance from the street, which eliminates all possibility of interference with the lobby.

An efficient air conditioning system is installed in the basement of the building, and is designed to change and recirculate the air in the entire building up to 10 times in one hour. It is also planned, in the cold weather, to maintain a pressure inside the building sufficient to prevent an incoming rush of cold air when the doors are opened.

Interior lighting in the building is mainly of the incandescent type, with most fixtures recessed in the ceiling.

All directional signs have been chosen with the idea of blending with the architectural and decorative scheme and the overall effect is one of complete coordination.

The policy of the Cinema is to show first-run films as consistently as is possible, and facilities exist to take immediate advantage of any new developments which may come about in the production and presentation of moving pictures.

CONSTRUCTION and MATERIALS

1954-55

Plywood Goes to the Theatre

Review of the Many Uses to Which the Versatile Plywood Material May Be Adapted In Indoor and Outdoor Theatres

By Robert E. Eskew
Douglas Fir Plywood Association

BRIEF: *There are very few building materials which can even come close to plywood as far as the many and varied applications to which it may be put . . . Plywood is both light in weight and low in cost . . . These factors . . . coupled with its rugged strength . . . make it ideal for use in conventional roofed and outdoor theatres.*

This article presents the reader with a review of the various types of plywood that are currently available . . . and the specific uses for which each type is best suited . . . There are valuable tips on how to properly paint and finish plywood for exterior uses . . . and for interior purposes . . . The many areas of the theatre which can be improved with plywood are given individual treatment . . . There is also an interesting section devoted to drive-in theatres specifically . . . and how plywood is used for screens . . . concession buildings . . . boxoffices . . . etc.

It is said that the test of a good actor is versatility and the same holds true when it comes to building materials. Fir plywood, the most versatile performer in today's building materials field, plays its vital role in the construction and remodeling of indoor and outdoor theatres throughout the nation, to continued applause from theatre owners and builders alike.

Versatility

Plywood's claim to versatility is not a boast; it's a fact. For example, here's an idea of how much of the construction show plywood can carry: subfloors, underlayment for finish floors, wall and roof sheathing, exterior siding, interior wall paneling, outdoor picture screens, partitions for rest rooms, backstage dressing rooms for ushers and usherettes, and built-in storage units for marquee letters, candy, tickets and general theatre supplies.

Versatility such as this plus fir plywood's large standard panel size (four by eight feet), which means speed of application, adds up to outstanding savings for the theatre owner or builder who specifies plywood-savings not at the expense of durability and appearance, but in addition to it. For fir plywood, despite its light weight and low cost, is rugged structurally. Pound for pound, it is one of the strongest building materials on the market today. As for appearance, it offers the warm, rich-grained surface of real wood for natural interior wall paneling as well as a smooth, unblemished surface for fine painting.

Types of Fir Plywood

When specifying fir plywood for any building or remodeling job, it is well to know that it is manufactured in two distinct types. Exterior type plywood is made with 100 per cent waterproof glue for use where exposed to moisture or weather. This type of plywood is branded on the panel edge with the industry-owned grademark, "EXT-DFPA," which is the buyer's assurance that it won't come apart even if it is subjected to boiling water. On the other hand, Interior type plywood is manufactured with a highly moisture resistant but NOT waterproof glue. This means it can withstand occasional wettings such as might occur during construction but will come apart under constant moisture.

Knowledge of these two types will eliminate two dangers: delamination through use of an interior panel where exterior plywood was indicated; unnecessary expense because exterior plywood was used where less expensive interior panels would have been more suitable.

Also, it is well to know that within each type of fir plywood are a half dozen "grades" which further suggest specific use. These grades are determined by the appearance of the outer faces or plys of a panel. For example, an exterior panel with one or two



FIR PLYWOOD offers many ideas for lobby displays and aisle markers like this Bugs Bunny cutout. Such displays and cutouts are easy to make, and economical when fir plywood is used.



ACOUSTICALLY PERFECT panels of fir plywood have been used as part of the sound system in Temple Theatre, Tacoma, Wash., satisfactorily.

smooth, highly paintable surfaces would be wasted on anything but a finish job. Whereas, a panel with rough, unsanded faces would be unsuitable for anything but a structural application. A helpful chart of types and grades of fir plywood with suggestions for specific use in theatres will be found later in this article.

Fir Plywood for Theatre Construction

Fir plywood's remarkable two-way strength, which makes it such a valuable structural material, is the result of its cross-grain panel construction. Thin sheets of veneer (plys) spread with adhesive are assembled in odd numbers (three, five or seven plys to a panel) with the grain pattern of each sheet running counter to that of adjacent plys. This cross-lamination of plys also makes fir plywood puncture proof and split proof, both of which are invaluable qualities to the theatre owner, especially if he operates on "wild west" Saturday afternoons.

Either in new construction or remodeling of the modern theatre, fir plywood is an economical, ideal solution to the problem of subflooring. This is one of the most important elements in construction because the durability and appearance of finish flooring, whether it be wall-to-wall carpeting or asphalt tile, depend entirely on its foundation. Plywood subfloors give rigidity, level surface and dimensional stability (resistance to shrinking, swelling, warping and buckling) and plywood underlayment, the smooth base for finish flooring, provides broad, level, joint-free planes which means no bulges, humps or other dangerous points of wear in the finish material.

Walls sheathed with rigid, light weight panels of plywood have been proved twice as strong as those sheathed diagonally with ordinary boards. To the theatre builder, this means added strength and durability plus savings because the big four by eight sheets go on quickly with less nailing necessary. The same holds true for roofs sheathed with fir plywood.

Smooth, paintable panels of exterior type fir plywood offer a striking contrast when used for siding accents in combination with rough stone, cement brick or glass. In suburban neighborhoods, the community theatre sided with dramatic panels of Texture One-Eleven with its rich linear and textural pattern takes on a unique distinction. The outstanding value of this new panel material in addition to its visual beauty is that if offers considerable savings because it can be applied directly to studs as a combination sheathing and finish material.

Theatre interiors benefit extensively through use of fir plywood for wall and ceiling paneling, built-in refreshment bars, rest room booths and partitions, backstage storage and dressing room facilities. Lobby or foyer walls and ceilings paneled with warm, attractive real wood extend a hospitable welcome and offer an air of informal comfort when finished with a rich, natural lustre. Built-in candy bars are economical to build and can be made portable because of plywood's light weight and because it requires so little framing. Backstage storage units and dressing rooms go together quickly and cut costs further because they can be constructed of less expensive grades of interior plywood with no sacrifice of strength and durability.

Finishing Fir Plywood

Fir plywood finishes easily and well. But in the case of a theatre owner who plans to do his own finishing, it is well to know that a job of painting or stain-

EXTERIOR TYPE FIR PLYWOOD

EXT-DFPA — A-A	For permanent outdoor uses where appearance of both sides is important: entrance display walls, partitions, signs for drive-in theatres.
EXT-DFPA — A-B	Uses similar to Exterior A-A panels but where appearance of one side is less important: ticket stalls, offices for drive-in theatres.
EXT-DFPA — PLYSHIELD	Versatile "one-side" grade of exterior fir plywood with waterproof bond, excellent for picture screens for drive-in movies.
EXT-DFPA — SHEATHING	Unsanded grade of exterior for backing or rough construction: backing for outdoor screens, tool and maintenance sheds for drive-ins.

INTERIOR TYPE FIR PLYWOOD

INTERIOR — A-A	For all interior applications where both sides will be in view: cabinet doors, built-in storage units, displays, rest room partitions.
INTERIOR — A-B	For all inside uses requiring one surface of highest appearance and opposite side solid and smooth: aisle markers, lobby displays.
PLYPANEL	Many-purpose "one-side" material for interior use where appearance of only one side is important: wall and ceiling paneling, built-ins, counters, fixtures, displays, cut-outs, finish floor underlayment.
PLYBASE	Base and backing material: backstage storage compartments, equipment stalls; face solid, paintable.
PLYSCORD	Unsanded sheathing or structural grade of interior fir plywood: wall and roof sheathing, subflooring, temporary enclosures, partitions.

FIR PLYWOOD SPECIAL PANELS

TEXTURE ONE-ELEVEN	Striking exterior panel with waterproof bond for distinctive exteriors; marked by deep parallel grooves and rich texture of unsanded real wood: for fences, display walls, ticket stalls, entrance walls in drive-in theatres. Effective decorative material for interior accent walls, displays.
OVERLAID PLYWOOD	Exterior fir plywood with waterproof bond, excellent, grainless paint surface of glass-smooth, flint-hard resin: suitable for siding, entrance display walls, counter tops, picture screens; impervious to acids, abrasion.
PLYRON	Composite panel with either exterior or interior bond offering wearing qualities and toughness of tempered or treated hardboards plus strong, rigid fir plywood backbone: cabinet doors, exterior siding, counter tops.

ing will only be as good as the preparation and materials that go into it. Always make certain that the surface to be finished is smooth and free of dust and oil. And use nothing but top quality paints and stains.

In painting exterior type fir plywood, the determinant is whether the finish surface is smooth or textured. In the case of a smooth surface, the best paint for regular wood is also best for exterior fir plywood. High grade exterior house paints of either TLZ formulation or white-lead-and-oil give excellent service. Paints which set to a hard, brittle film should be avoided.

To prevent the possibility of any surface checking when using exterior plywood, edge-sealing is recommended. A heavy application of high-grade exterior primer, exterior aluminum paint or heavy lead and oil paint does the best job. In unusually damp localities, and especially in the case of fir plywood outdoor picture screens, it is wise to prime the back of panels before construction starts with a coat of exterior primer.

The best painting system for exterior plywood is this:

1. The prime coat, the most important coat of all. This seals the wood and provides a good base for the following coats. A top quality exterior primer thinned with one pint of pure raw linseed oil per gallon of paint, applied with a brush, is the best. High grade aluminum house paint also makes a good primer.

2. and 3. Over the prime coat apply second and third coats according to directions on the can.

High quality 2-coat TLZ house paints can be used. However, each coat must be proportionately heavier so that the same dry film thickness, as in the 3-step system, is built up. First, brush on the primer, thinned as in step one above; then apply a second coat according to directions on the label.

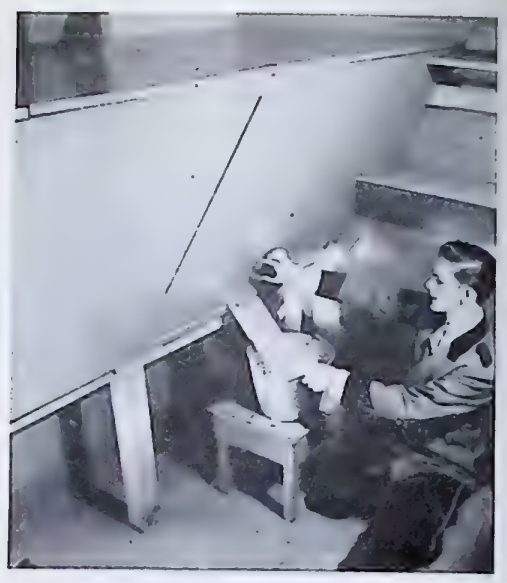
Finishing Textured Surface

On the other hand, if the finish surface is textured, as in the case of Texture One-Eleven, finish procedure is different for two reasons. First, the object is to preserve the textural qualities and natural low sheen of the material. Second, edge-sealing can be omitted because any surface checking will only add to the weathered beauty of the wood.

To preserve the naturalness of T 1-11 a highly pigmented opaque stain finish is recommended. Not a stain in the conventional sense of the word, this type of finish material is known in the trade as either SHAKE or SHINGLE paint. Its desirability stems from the fact that it dries flat; does not penetrate completely into the surface but leaves a thin coating over it; produces uniform color over dark and light parts of the wood grain and knots; is not translucent or transparent; softens grain pattern but does not hide it and does not destroy textured surface with a smooth, paint-like film. For maximum durability, a two-coat brush application of this stain is recommended, however, one coat will cover thoroughly.

Low pigmented stains when applied to exterior fir plywood (either smooth or textured) when permanently exposed to weather, are of insufficient durability to adequately protect the wood and are definitely not recommended.

CANDY-STRIPED plywood at the Roxy was built by theatre manager from own design to attract the customers. On caster, it can easily be moved out of the way when the stand isn't being used.



LIGHT-WEIGHT, but rugged plywood solved the popcorn storage problem backstage at the Roxy, Tacoma, Wash., at little cost or loss of space.

Finishing Interior Plywood

Interior fir plywood is even easier to finish with good conventional wall and woodwork paints or enamels. Here again, it pays to properly prepare all surfaces and to use nothing but the best mate-



rials, carefully regarding directions as to mixing, thinning, and drying time for each coat.

Interesting textured effects can be obtained with stippling paints, either flat or gloss. This type of finish is easy to apply and covers minor imperfections. For cabinet doors or other surfaces which require frequent cleaning, washable paints or enamels are recommended. Here are the basic steps to follow when painting or enameling plywood:

1. Fill open surface areas with wood putty or dough. Sand lightly and dust clean. For additional smoothness, panel edges can be coated with surfacing putty or wood putty. Apply a thin layer and sand smooth when dry.

2. Brush on flat paint or enamel undercoat. Cover sides and edges. If you discover any unfilled surface blemishes, fill with spackle when coat is dry. Sand lightly and dust clean.

3. Apply second coat of undercoat. For high gloss enamel finish use undercoat mixed of equal parts flat undercoat and high gloss enamel. For semi-gloss or flat finish, use undercoat tinted to approximate shade of finish coat. Sand lightly when dry.

4. Apply final coat as it comes from can. This coat as well as preceding coats may be thinned slightly with turpentine or thinner to get better brushability.

A two-coat system consisting of prime and finish coats may also be used.

Textured surfaces may be obtained by priming as in Step 2 above, followed by a heavy coat of stippling paint. The paint coat may then be textured with a stipple brush, roller or sponge.

If water thinned paints are to be used, the plywood should first be sealed with a clear resin sealer, shellac or flat white paint to prevent grain raise. The paint should then be applied according to manufacturer's directions for a sealed surface. If slight grain raise is not objectionable, seal coat may be omitted.

Light stain glaze, bond, wax stain and dark finishes are also very effective on fir plywood. These all subdue the grain pattern of the wood and yet retain its natural warmth and character. Plywood should first be sealed with clear resin sealer before dark stain is applied.

Plywood for Outdoor Screens

It would be a safe guess that most of the picture screens in use by the thousands of drive-in theatres throughout the country today are exterior type fir plywood. Big panels of plywood simplify fabrication and offer broad, flush, relatively joint-free, highly paintable surfaces for maximum image reflection at very low construction and maintenance cost. Many outdoor theatres carry the plywood theme thoroughout by using it as well for fences, entrance way display walls, partitions, ticket stalls and directional signs. In the construction of this type of theatre plywood means that practically all the building and finishing can be done with the one material, thus reducing sharply the cost of working and handling.

Plywood for outdoor theatres means low upkeep too. Despite the fact that screens, fences, ticket stalls and the rest are subjected most of the winter to rain, snow, sleet and hail, they stand up well when built of plywood. And come spring, cleaning and re-finishing of all parts of the theatre is simple and fast because of the smooth, unobstructed surfaces possible with plywood construction. In many instances, plywood screens finished with standard screen or aluminum paint do not require repainting more than once every three years. Here are some examples of fir plywood presently "performing" in outdoor theatres.

The exterior fir plywood screen and screen building of the Orange Drive-In Theatre near Orange, Calif., is still in excellent condition after 13 years of exposure to the weather. This unusual structure was built of 82 individual plywood boxes in 1941 and has had only two coats of paint since that time.

Designed by the architectural firm of Balcher, Bryan, Perkins, and Hutchason of Los Angeles, each box of the struc-

ONE OF THE first drive-ins constructed was the Orange, Orange, Calif. Use of plywood for surfaces both inside and behind the large screen in this and other early outdoor theatres established value of material for D-I's.

SCREEN VIEW OF Orange shows construction, which consisted of 82 individual fir plywood boxes. Each box is eight foot cube. This structure has only required two paintings since the drive-in was constructed in early 1941.







HUGE FIR plywood screen at Fife, Fife, Wash., (above) is good example of newer type of steel framing with attached plywood projection screen. Fir plywood trusses (below) supply the structural backing for this prefabricated outdoor screen. Plywood provides light-weight framing member of great strength.



ALTHOUGH DESIGNED first as an outdoor siding material Texture 1-11 fit contemporary interior trends. Designers are using it for paneling, accent wall, and for other indoor applications.



ture is an 8-foot cube with a Douglas fir frame and a covering of three-eighths-inch exterior type fir plywood. The plywood is glued to the frames with Laux No. 88 glue.

This particular theatre was among the first drive-ins constructed. Use of plywood for the screen and screen building in this and other early outdoor theatres established the usefulness of the panel material for this special type of structure. The structure was prefabricated and erected on the site just prior to the war's interruption of construction for entertainment purposes.

The Ballantyne Company in Omaha, Neb., uses 56 foot fir plywood trusses as the structural backing for drive-in movie screens. In this particular application, exterior type fir plywood three-quarter-inch thick gives these trusses their high degree of rigidity.

Each screen requires four trusses on which lumber and screen surfacing are mounted. The plywood forms the heart of the truss and is framed on both sides and at top and bottom with two-inch by eight-inch chords. The plywood is applied in four-foot widths perpendicular to the chords and each joint is covered with two-inch by six-inch framing. Each set of four trusses for one screen is tied together with two-inch by six-inch stringers on two-foot centers.

In addition to providing necessary rigidity to the trusses, plywood simplifies prefabrication and provides for a light-weight framing member without sacrificing strength. Assembly is completed on the ground and then the screen is raised into place.

In Tacoma, Wash., the Starlite Drive-In Theatre has been using an exterior fir plywood screen for several years. The smooth, flush surface of the screen which measures 52 by 40 feet is finished with a special screen paint perfected by Parker Paint Company with a high degree of reflectivity. Chester Nilsson, owner of the Starlite, says he only has to refinish the screen once every three years. Using three-quarter inch exterior plywood over 16-inch center and allowing a one-thirty-second-inch gap between panels to account for moisture equilibrium, Nilsson has avoided any problems of warping or buckling.

Plans are near completion for the erection in Renton, Wash., of a new drive-in theatre which will feature an 85 by 45 feet exterior fir plywood screen suitable for the reproduction of wide-vision CinemaScope films. Oscar Chiniquy, owner and builder, plans to use one-half-inch exterior plywood over 18-inch centers for added rigidity. The framework will consist of a multi-braced structure of four by eights and four by sixes to provide maximum stability for the outsize screen. He will finish the plywood screen surface with either aluminum or special screen paint.

The Fife Drive-In Theatre at Fife, Wash., just outside Tacoma, is an ideal example of the newer steel framework which utilizes an exterior fir plywood screen. Lumber framing members bolted to the steel frame hold the rigid, light-weight plywood screen which, despite heavy rain, requires only minimum maintenance. It is finished with Parker's special, highly reflective screen paint.

Paint Fire Hazards Away

A Discussion of Some Common Causes of Theatre Fires and How Fire Retardant Paints Can Lessen the Danger

BRIEF: ***The importance of proper fire protection . . . and proper fire prevention equipment for motion picture theatres can not be overemphasized . . . The end results of even a small fire in a crowded theatre building can be panic . . . and the loss of many lives.***

The problem of making sure that theatres are as fireproof as man can make them is one that no self-respecting exhibitor can ignore . . . for even a single moment . . . Equipment such as sprinkler systems . . . fire extinguishers . . . and smoke detecting devices should be part and parcel of any theatre . . . for it is just as important as the seats . . . or the projection and sound equipment.

In recent years a new product has been developed which places still another weapon in the fire prevention arsenal . . . fire retardant paints . . . This article will discuss the various uses to which this type of paint can be put . . . as well as to trace its development.

By A. SOPHIR
Sales Director, Fyr-Kote National Sales, Inc.

There isn't a theatre owner in America, I am sure, that doesn't realize the tremendous importance of proper fire prevention, but let's face the facts and be honest. Most of us have a "Let George Do It" attitude towards fire prevention. Most of us go about our daily work letting others assume the responsibility for fire prevention in our theatres, waiting until a Fire Inspector comes around and raises the Devil. Most of us will agree also, when we stop to consider, that "George" isn't a very reliable person. Most of the time there just isn't any "George."

Losses Mounting

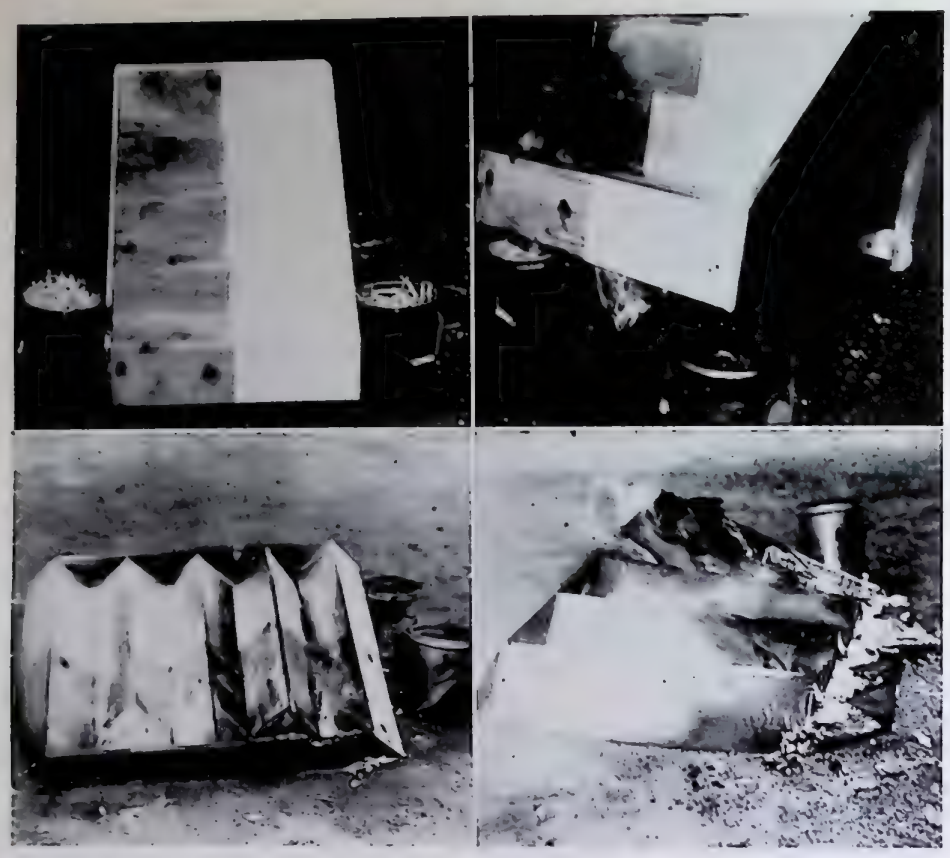
Some theatre owners still shrug off fires as being due to carelessness and do practically nothing about it because they take the position that it just can't happen to them. It is obvious that such passive attention is expensive in money, and much more important, expensive in lives. Fires can't be shrugged off. They must be prevented through an active program on the part of every theatre owner because year by year our fire losses are mounting tremendously.

No one is perfect. Everyone is subject to fatigue, whether it be due to worry and tension on the job or off the job. On top of all this, some people suffer from a personality maladjustment which may be exhibited in the form of indifference, inattention, indolence, arrogance, recklessness or hostility. All of us in the theatre business have a personnel problem today. Get a large group of people working together and you are bound to find one or several of the types mentioned above. The question is, how can anyone be assured of proper fire prevention conditions if everyone else, including the theatre owner, is subject to these human weaknesses.

Do you realize that every day, on the average, 34 people burn to death. Five thousand fires break out, and two million dollars worth of property is destroyed by fire. Just think of that! Every single day! That is no idle statement. Those are positive facts as issued by the National Fire Protective Association. Yet there are theatre owners who continue to resist the efforts of others who are trying to make their buildings

TERRIBLE FIRES, such as the one seen below, can be largely avoided if all the proper safeguards are taken, such as fire retardant paints.





DRAMATIC TEST shows one-half of stairway (upper left) treated with Fyr-Kote and fire started. After 7 minutes (upper right) flames engulf untreated portion which collapses after 12 minutes (lower left). Fyr-Kote treated section still retards fire after 26 minutes (lower right). This test offers visual proof of the ability of this type of paint to be barrier against spread of fire.

safer and better. Surely there must be something basically wrong with that person even if he does not know the full import of what he is doing, or is cold blooded enough not to care what happens to himself or to others around him. It is up to theatre owners as a group to educate that type of person and make him realize that he is jeopardizing the safety of his associates, as well as his own.

Good Housekeeping

Surely the one basic and greatest safety factor is good housekeeping. All of us realize that and it is, by far, more important than anything else you can do. Yet we all agree that there is a good deal of human carelessness involved, and no matter how rigid the supervision might be, there is always that one slight chance that a careless match or cigarette can do damage beyond repair.

Surely every theatre owner should see that he has the best type of construction possible in his particular building. Fire detection devices are extremely helpful. Alarm transmission is highly recommended and by all means good sprinkler equipment can prove to be a great safety factor.

The most recent estimates of fire losses in theatres prepared by the National Fire Protective Association, which is an international organization, are those for the year 1952. This tabulation includes the number and loss in fires in various occupancies, but important to our people is the fact that in that year there were 2000 fires in theatres, resulting in a loss of over six million dollars.

Theatre Fires

There are hundreds of fires happening in theatres all of the time, but just in the last few years we have had some disastrous ones.

On September 26, 1948, Picayune, Mississippi a $50,000 fire, a two-story brick and wood theatre was totally destroyed when fire occurred at 12 midnight in the second floor projection room. On the arrival of the Fire Department the building was totally involved. The theatre had been closed for several hours previous to the outbreak of the fire.

On August 23, 1948 at Glendale, California, the failure of an asbestos curtain to work efficiently allowed the fire to spread to the auditorium from back stage. A man was preparing to flame-proof the stage drop and had been testing other drops previously flame-proof with a match. It is possible that during this testing the untreated curtain may have ignited. The workmen failed to use the stand-pipe that was provided back stage. This one story fire resisting building was badly damaged to the tune of $125,000.

On July 15, 1948, the operator of a motion picture projection booth was critically burned when a reel of film that he was changing suddenly flared up. All patrons escaped without mishap and the fire was confined to the booth. A mere $5,000.

On June 26, 1948, at Los Angeles, a $75,000 fire destroyed approximately one third of a two-story concrete theatre. The fire originated on the first floor at the stage and spread to the roof, causing a damage of $75,000.

On May 9, 1947 at Craig, Colorado, complete destruction of a one-story cement block and frame theatre building, and serious damage to two other buildings. Although the cause was not definitely determined, it was believed to be started by careless smoking. A 25-mile wind spread the fire to the other buildings. An $84,000 damage.

At Presque Isle, Maine a $150,000 damage to a motion picture theatre building. Again it was the strong wind that spread the blaze and embers over a block area.

At Brazil, Indiana a $205,000 damage on February 23, 1947. Believed to have been caused by boys smoking in the balcony during the last show. Fire was discovered at 5:30 a.m. the next morning, breaking through the balcony into the apartment below. The building was of two-story brick joisted construction with open stairways. The building was totally destroyed and several others damaged.

On February 7, 1947 at Texarkana, Arkansas, a $75,000 fire starting at the first floor in the rear totally destroyed a two-story brick building.

At Cairo, Illinois on February 6, 1947, a $130,000 fire believed to have been caused by a defective furnace flue. The fire gained such headway before the Fire Department arrived that they were hard pressed to prevent the spread to other neighboring buildings.

If you are the type of theatre owner that thinks "It can't happen here" you will be amazed at how almost every day more and more fires are happening in theatres, even with modern fire fighting apparatus and fire prevention. Something must be done to stop the tragic loss of life and property. The proper application of fire retardant paint such as this Fyr-Kote material can definitely help prevent the rapid spread of flame, which after all is the main thing that gives people time to get out of a building and the Fire Department to get in and control it.

Common Fire Causes

Check your own theatre against these common fire causes in motion picture theatres. Here they are as issued by the NFPA.

FIRE RECORD —
MOTION PICTURE THEATRES

Projection Booth Fires	37.0%
Smoking and matches	21.0
Misuse of electricity	10.0
Heating defects	8.0
Incendiary	6.5
Spontaneous ignition	4.5
Exposure	2.5
Defective chimney or flue	1.5
Multiple occupancy fire hazards	1.5
Hot ashes	1.5
Explosion (unknown causes)	1.0
Children with matches	1.0
Boiler explosion	1.0
Cloth or scenery touching bulb on stage	0.5
Miscellaneous	3.0
Total	100.0%

FIRE RETARDANT PAINT

However, in the last few years a new method of fire prevention has come forth which might well prove to be the greatest advancement yet made for thea-

tres in particular. It is a fire retardant finish which looks like, and is applied like ordinary paint. It has all of the decorative qualities of paint but wears much longer and has the unique characteristic of rendering the surface non-flame supporting. This material carries the Underwriters Laboratories' label and is the result of research that has gone on as far back as 1880. It was in that year that the first patent was issued for fire retardant finish. Since then many formulations have come forth. However, most of them were based upon water soluble solutions which would not be practical for theatre use because the first time they were washed the finish would have been removed.

During all of those years, until World War II, fire retardant finishes and paints remained a gleam in the eyes of fire prevention officials and theatre owners, because the idea of a fire retardant finish was sound. In fact, from a theoretical, as well as a practical standpoint, if complete interior walls and ceilings throughout a theatre could be finished with a non-flame supporting material, a great many small fires could be controlled and prevented from becoming big fires.

In 1948, a young chemist, George Claytor, from Memphis, Tennessee was placed in charge of research for the Morris Paint & Varnish Company, concentrating on the development of at least a theoretical perfect fire retardant finish, in cooperation with Jack Sophir, vice president of the Morris Paint Company and Fyr-Kote's original creator.

These men worked doggedly, passing test after test, in the laboratory and the field, including U. S. Engineers' test, Army, Navy, independent Laboratories, and most important the Underwriters Laboratories.

Investigation

The Underwriters Laboratories investigated this product for five months. The purpose of the investigation being to ascertain the effectiveness of this material, and to observe the general appearance and workability of the material. Even its tendency to corrode nails or screws was tested as well as the nature of smoke in the fumes emited under fire exposure, because many times the fumes from a fire can be as deadly as the fire itself. For testing purposes this Fyr-Kote material was applied to cellulose fibre board. Two coats without priming the surface. Cellulose fibre board was used because it is considered one of the most combustible of all accepted building materials.

In these tests the Underwriters Laboratories made observations covering the spread of fire, the general character of the fire, the temperature developed, intensity and nature of the smoke released, and comparison made scientifically to surfaces that were not finished with Fyr-Kote. At the end of each flame exposure period, the uncoated boards continued to flame and had to be extinguished with fire extinguishers, whereas on those surfaces coated with Fyr-Kote the flames started to recede and extinguish themselves within 30 to 45 seconds.

Another unique feature that is especially valuable in the theatre field is the fact that Fyr-Kote material contains a non-toxic but irritating distinguishable odor in the material so that the moment a flame starts to hit the surface it gives off adequate warning of fire being present and smouldering.



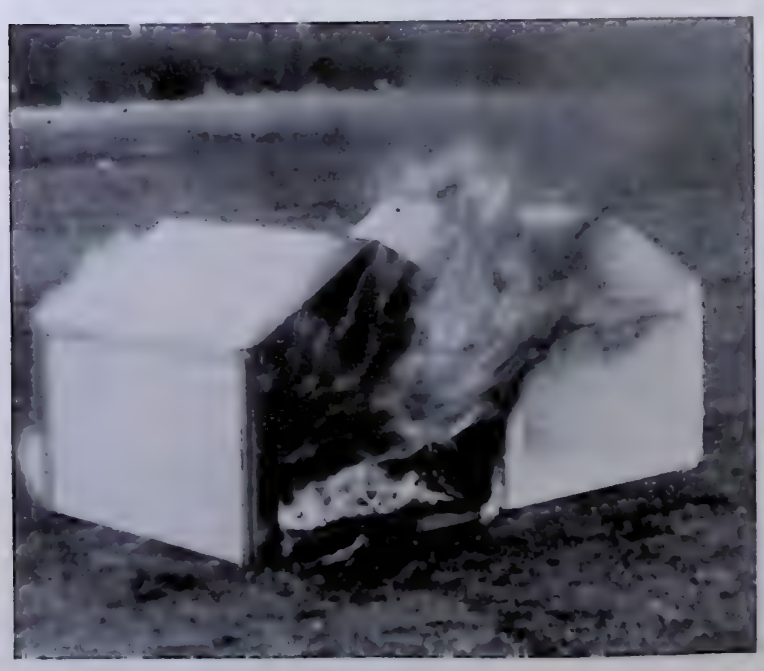
UNTREATED structure at left (above) blazes while Fyr-Koted structure is unharmed. The fire spreads (lower left) causing intense heat. After 21 minutes (lower right) Fyr-Kote retards flames.

New Product

Another great development in fire retardant materials, particularly for the theatre field, is a product named Fyr-Kote Clear Flameproofer. This is a colorless liquid that can be applied either by dipping or spraying onto any absorbent material. It is especially useful for back drops, draperies, curtains, etc. It has absolutely no effect upon the color or texture of the material, nor does it effect the finest fabrics. Yet it makes any absorbent material absolutely fire retardant. A very simple test is made by dipping a curtain into this material and then another similar curtain undipped, holding a torch to each. The one that has been treated will not flame, but will merely char. The one that has not been treated with Fyr-Kote will immediately go up in flames. Certainly every theatre owner must realize the importance of fire proofing every fabric, every type of cloth, drapery, etc., in his house.

CONCLUSION

From the layman's standpoint, this Fyr-Kote fire retardant finish contains a mass of minute "built in" fire extinguishers. When the surface is exposed to flame the Fyr-Kote throws out a heat blister which pops open and throws out carbon dioxide and calcium chloride to smother the fire and to retard the spread of flame right on the surface. It seems to us that if the element of time is necessary, it is more so in the theatre than any place else because when a fire starts, if it can be controlled and restricted until the Fire Department comes, or until it is put out with extinguishers, it can prevent panic and death. This might well prove to be one of the greatest advancements made in fire prevention. Who knows how many lives might be saved? But remember always that fire prevention is your business. The theatre owner's business. You can't have the "Let George Do It" attitude. Make every day a fire prevention day in your theatre.





Oriental Movie Palace

A Thorough Description of the Equipment and Design of the Hoover Theatre in Hong Kong, One of the Orient's Finest, Newest Theatres

By CHIEN SING SHOU

The Hoover Theatre, of Hong Kong, the latest motion picture theatre of the Orient, has a seating capacity of 1500, and offers its patrons the finest entertainment that modern equipment and facilities make possible.

Beauty and Comfort

Designed for beauty and comfort, the Hoover's imposing edifice is situated at Causeway Bay, facing three major thoroughfares. For the convenience of its patrons, the theatre has two entrances, which is just one example of the efforts made by the designer and owner of the theatre to build the most luxurious movie palace in Hong Kong. The cost of construction was over one million United States dollars.

The exterior of the buliding is covered with Italian marble, and the interior boasts spacious lobbies provided for patrons on the ground floor and upper floor. Both lobbies are also paved with Italian marble, as are the main floor lobby walls. The walls of the upper floor lobby are covered with six-ply walnut veneer.

BRIEF: ***If there are any who still doubt the universal appeal of not only motion pictures . . . but of the international desire for fine theatres in which to present them . . . this article should do much to banish such thoughts.***

This article . . . offers detailed information about the Hoover Theatre . . . in Hong Kong . . . The theatre is completely up-to-date both in its architectural design . . . and in its projection and sound equipment . . . The Hoover is equipped to show all of new processes including CinemaScope . . . and other wide screen systems . . . 3-D . . . stereophonic sound . . . and standard films . . . The finest air conditioning equipment keeps the large house comfortable at all times . . . These are just a few of many features found in this house.

Although this feature deals with a theatre in the Far East . . . there is much information given here about theatre construction . . . and decoration which should be of interest to exhibitors all over the world.

The Hoover can lay claim to having the largest projection booth in the colony. Four Simplex projectors enable the screening of three-dimensional films without the necessity of having an intermission. In addition, the theatre also has stereophonic sound with 19 auditorium speakers of the latest type manufactured by RCA.

An all-purpose wide screen has been installed for use with standard, 3-D, and CinemaScope films. To match this wide screen four high amperage lamp houses and two giant motor generators have been set up to give the desired screen brilliance.

The architect for the theatre was Robert Fan, the contractor was the Taylor Construction Company, and the owner, the Hoover Entertainment and Land Investment Company, Ltd.

The task of the architect, subject to the various local conditions, restrictions, and limitations on the design and supervision of the erection in Hong Kong of a modern and functional theatre building, is by no means a simple task. Therefore, it is understandable that the successful completion of this modern and practical theatre affords considerable gratification to the one who was entrusted with the design and supervision of the construction.

Fundamental Principle

The fundamental principle and objective of the theatre plan was to provide ample lobby and foyer accommodations; easy and simple crowd control; comfortable seating; decorative appointments in good taste; a spacious and pleasing atmosphere; and, at the same time, conform with the most up-to-date and exacting requirements of the still fluid and experimental art of motion picture exhibition, together with the ever improving types of mechanical equipment.

THE HOOVER Theatre, in Hong Kong, is the newest theatre in the Orient, with a seating capacity of over 1500. It was constructed at a cost of $1,000,000 and equipped for CinemaScope and stereosound.



In seeking to design a building of modern lines, the architects were pleased with the results which, to a certain extent, combined the chief aims of the theatre with a satisfactory and attractive interior to create a building of functional comfort and pleasing lines that reflect good taste.

Exterior

The exterior composition presents the imposing balance of broad and essential masses, with the corner entrance and tower as the dominating features. The facade is faced chiefly with multi-toned cement concrete which is tooled to give the natural appearance of stone finish, over a course base of smart looking Belgian black marble. The massive effect of the tower at the corner entrance lends an imposing and dignified appearance, and yet, not without the feeling of a gay and inviting quality.

Entrances

The entry direct to the back stall is through the two-way staircase in the middle of the grand lobby, while the main winding stairway to the mezzanine floor leading to the balcony, is placed at the other end of the grand hall with the vestibule, being entered from the other main entrance. This arrangement happily provides traffic for two distinctly different routes of circulation, thus avoiding the usual congestion in the grand lobby.

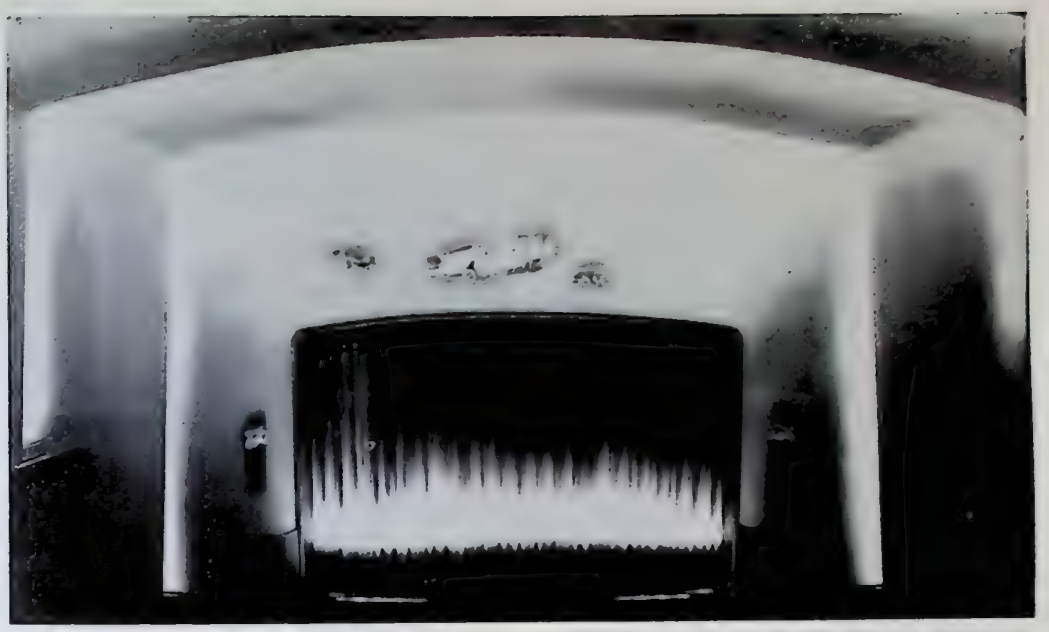
The openess of this stairway promotes an easy promenade to the patrons going up to the mezzanine, and unconsciously induces them not to notice the height of the climb. The additional height is unfortunately unavoidable due to the requirements to provide the car park under the auditorium, the usefulness of which seems to have proven itself practical and justified.

This car park, accommodating 38 cars, is reached from one of the three streets, with separate openings for entrance and exit of vehicles. One of the ticket booths is located next to the stair entrance from the Irving Street level to the main auditorium floor, while the other ticket booth is located at the entrance of the passage from Yee Wo Street, and from there it leads up to the front stall through another stairway.

Decorative Treatment

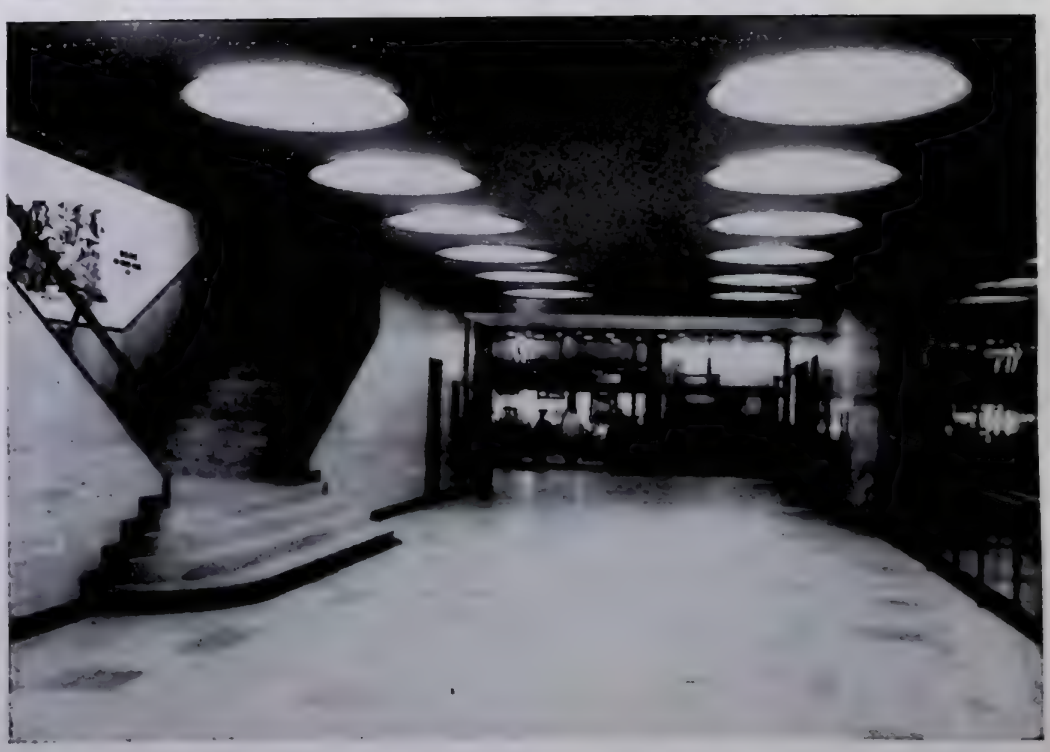
The total seating capacity of the Hoover is close to 1500. All chairs are arranged in a staggered fashion to afford maximum ease to sight-lines, and are designed with the feature of push-back seats, which keep patrons luxuriouly seated throughout the show.

The decorative treatment of the house has been carried out with simplicity and refinement. Every care has been exercised for the use of the suitable color in a quiet manner, and yet not devoid of cheerfulness and friendliness. The Walnut panelling in natural finish along the wainscots and proscenium arch lend an additional sense of comfort. The combined use of gypsum and acoustic plaster for the walls of the auditorium has been calculated for the purpose of acoustic correction. The lighting troughs are equipped with cold cathode lamps together with the general indirect light-



THE STAGE (above) is designed to show all the new film processes and also to accommodate live stage shows. Auditorium (below) has two levels with 518 seats in balcony, and 964 orchestra seats.





THE WALLS and floor of the main lobby are furnished with Italian Travertine and Belgian marble. Directly underneath is a garage with space to hold 38 cars, and avoids a parking problem for staff.



THE LOBBY (above) is well lighted and furnished with divans along the walls to provide seats for patrons who are waiting for other members of their party. The mezzanine lobby (below) carries out the decorative scheme of the theatre. Every care was exercised to create a friendly atmosphere.



ing scheme in the auditorium, which are all controlled by a system of dimmers.

Fire Protection

In addition to the easy accessibility, the auditorium is provided with ample means of emergency exits, well-distributed at various points. For fire protection, besides the fire curtain, there are fire hydrants, extinguishers, and sprinkler systems placed at salient positions in accordance with the regulations of the Fire Department. All materials incorporated in the building have been carefully selected for their fire-resisting qualities.

The structural design of the building is entirely of reinforced concrete, resting on a foundation of Vibro Piles. The balcony is carried by a reinforced concrete fulcrum truss with a system of cantilevers. The roof trusses are built of structural steel with a fireproof suspended ceiling of gypsum plaster board and corrugated asbestos cement roofing.

Glass Doors

Glass doors, seven pairs of which have been installed in the Hoover, are processed from one-half inch thick polished plate glass, which is fully toughened by a patented scientifically controlled process.

This treatment endows the glass with special properties, in addition to those of the originally untreated glass, including an increase of mechanical strength from five to 10 times that of ordinary plate glass; a greatly increased thermal resistance enabling the glass to withstand wider and more sudden temperature changes without damage or deterioration in quality; and perfect stability up to 295 degrees and greater flexibility.

Another important result of the toughening process is that the glass always fractures into granular particles which



THE MAIN winding spiral stairway (left) leading to the foyer of the balcony has an artistic statue of "Rita and Swan," and a water fountain with an art mosaic panel background. The plaster panel facing the main entrance (right) is decorated with sculpture and helps to direct the patrons.



cannot inflict serious injury as is liable to occur with ordinary plate glass.

Air Conditioning

The house is completely air-conditioned under automatic control. Overhead, above the projection booth, the nozzles supply fresh air into the auditorium and the animostats under the balcony ceiling are supplementary supplies for the rear seats. Recirculated air returns through large grilles on the rear wall of the auditorium.

A 150 ton Chrysler Airtemp unit furnishes the air conditioning. It is designed to maintain an inside temeprature of 78 degrees and 55 per cent relative humidity in the hottest weather. For the winter, warm air heating is provided and the temperature is kept at 70 degrees. The ventilation is taken care of by a blower delivering 37,152 cubic feet of air per minute, which works out to seven air changes per hour.

The Airtemp compressor is of a radial design, similar to an airplane engine. It is balanced dynamically as well as statically, and it has practically no vibration. It has an automatic unloading arrangement which enables the compressor to start unloaded. It also has an automatic high pressure cut-out, and low pressure cut-out.

There is an automatic capacity regulator which keeps the unit constantly balanced to varying load requirements. This feature saves current and makes it operate at peak efficiency at all loads.

The air ducts of the theatre are not only insulated on the outside, but also insulated with acoustical units on the inside.

CONCLUSION

In summing up, it can be safely said that this theatre is a showman's dream come true. All the knowledge and experience that could be called within the architects field, all the accommodations from the science of motion pictures, and all the comfort of the patrons have been assembled in this design to endow Hong Kong and its screen followers with the utmost picture entertainment, housed in a place that can easily be ranked as one of the leading new theatres in the Orient.



THE MARQUEE of the Hoover is simple, and it tends to place emphasis on the massive letters that are used to spell out the name of theatre.

1953-54 Review of Theatre Construction

The Year's Outstanding Developments in the Building and Remodeling of Theatres are Surveyed Pictorially

Although the development and acceptance of such things as CinemaScope, stereophonic sound, and other projection and sound techniques have succeeded in breathing new life into the exhibition end of motion pictures, it has done little to revive the construction of new indoor houses. Anyone who has had even a passing interest in the field can easily determine the reasons why. In the past 18 month period the average theatre operator has had to spend large sums of money for 3-D equipment, wide screens, anamorphic attachments, stereophonic sound equipment, etc. Even though most of these exhibitors did make some money as a result of showing films in the new processes, it must be remembered that it was the first time since the end of World War II that such a situation was common, and that most theatremen did not have large cash reserves. Therefore, although the theatre industry is now in the midst of one of its more prosperous periods, there is not yet enough capital available to undertake major theatre construction and still keep up with the equipment demands of presently existing situations.

Despite the fact that it is not possible to report a great surge in theatre building, there has been slight rise over the period covered in the last edition of THEATRE CATALOG. The outstanding feature in all of the new indoor houses is that the buildings have been built specifically with wide screen and directional sound in mind. The designs are usually fairly simple, and make generous use of the sweeping functional lines so prevalent in modern architectural thinking. The auditoriums in particular, indicate that designers and exhibitors alike have finally agreed that the lighting, decor, seating, etc., should add to the comfort of the audience, but should not create a conflict for attention between the screen and the surroundings.

Going a little further into the matter of audience comfort, largely as a result of watching television at home the average movie-goer today expects much more in the way of comfort and luxury when he visits his local theatre, than he did five or 10 years ago. As a result, items that were once optional in a theatre, such as air conditioning, large chairs, attractively furnished lounges, are all considered musts in the current situation.

Although new theatres have not been in the increase, there has been a definite surge of remodeling activity, which was predicted in this space last year. As pointed out before, most exhibitors do not have the money to build new theatres, but since they were forced to install new screens and other equipment, many of them took the opportunity to also install much needed seating, remove relics of the 20's, and in general give a bright new air to the entire operation.

As usual the one branch of theatre construction that continues on its merry upward spiral is the drive-in. Last year THEATRE CATALOG's survey showed that there were 3,841 outdoor theatres in operation in the United States. That figure today is well into the 4000 category, and could very possibly approach the 5000 mark in the near future.

The most interesting phase of drive-in construction has been the attempts to bring the new wide screen systems outdoors. Because of the tremendous areas which must be covered by the drive-in screen, and the need to maintain proper aspect ratios, towers well over 100 feet in length are quickly becoming a common sight.

A matter which has not yet been completely determined is the practicability of stereophonic sound for outdoor theatres. Currently there are two methods available. One makes use of a speaker containing three speaker cones, with one being located in the center, one on the left and the other on the right in order to give a directional quality to the sound. The other uses two standard speakers with one being used on the left side of the auto and the other placed on the right. As yet, there have been only a very few outdoor exhibitors who have installed stereophonic sound in their theatres.

The trend towards building drive-ins with auditoriums for patrons who arrive on foot, which was first noted last year, continues to grow. Many new drive-ins have constructed buildings complete in every sense except that a large window has been substituted for the screen.

The great comeback made by the entire motion picture industry should continue. However, with the emphasis still on projection and sound, it does not yet appear that indoor theatre construction will show an appreciable increase. Extensive remodeling of existing houses should quicken its pace. As for drive-ins, there are signs that they are approaching the saturation point in many areas, but should still remain the area of greatest construction activity.

NEW DRIVE-INS, such as the Hill Top, Evansdale, Mich., here envisioned to be built by the hundreds in all parts of the country on a steady pace.



INDOOR THEATRE construction activity has been primarily devoted to remodeling such as that at the Fifth Avenue Cinema, New York City.



CARIB •

Clearwater, Fla.

One of the first theatres to be constructed specifically for the showing of CinemaScope and the other new techniques, was this $400,000 house.

The main feature of the theatre front is a porcelain enamel map of the Caribbean Sea. The facade is illuminated by fluorescent lighting at night.

The Carib has a seating capacity of 1050, including two loges where smoking is permitted. The seats are made of foam rubber and are upholstered in avocado and coral colored nylon. All the seats are of the push-back type.

The dominant hues of the theatre color scheme, avocado and coral, are also featured in the lobby. The walls are coral and a pale green strip of terrazzo extends beyond the doors and around the entire lobby.





EVERY EFFORT has been made to furnish patrons with the finest facilities possible. The rest rooms are tastefully furnished, while the concession stand is easy to reach and well-stocked. The auditorium has excellent sight lines, and it has also been pleasantly lighted and decorated.





REFERENCE DATA

OWNER: EnVee Corp.
OPERATOR: Bay-Lan Theatre Corp.
ARCHITECT: James E. Casale.
SEATING CAPACITY: 1,050.
COST OF BUILDING: $150,000.
COST OF EQUIPMENT (including air conditioning) : $135,000.
SIZE OF LOT: 200′ x 250′.

Changeovers: RCA.
Curtain Controls & Track: Knoxville Scenic Studios.
Draperies & Stage Curtains: Knoxville Scenic Studios.
Generators: Hertner Electric Co.
Lenses: Kollmorgen Optical Corp., Bausch & Lomb Optical Co.
Projection Lamps: Strong Electric Corp.
Projection Machines: RCA.

Rectifiers: C. S. Ashcraft Mfg. Co.
Rewinders: GoldE Mfg. Co.
Screen: Raytone Screen Corp., Astrolite.
Sign Letters: Adler Silhouette Letter Co.
Sound: RCA.
Supply Dealer: Southeastern Theatre Equip. Co.
Ticket Issuing Machine: General Register Corp.
Ticket Chopper: General Register Corp.





MONTROSE •

Montreal, Quebec, Canada

Located in one of Montreal's larger neighborhood shopping areas, the Montrose is part of a building housing four shops and 11 apartments.

This was the first theatre in the city to be built especially with CinemaScope in mind, and is fully equipped with a 46-foot wide screen and a full stereophonic sound system.

One of the outstanding features of this theatre is the large vertical sign with each letter of the theatre name being circled in lights.

The Montrose has a seating capacity of 950. The chairs have green plush backs, and the leather seats are pumpkin. The metal parts are painted blue.

The projection and sound equipment is of the latest design, and is capable of showing all of the new film processes.

REFERENCE DATA

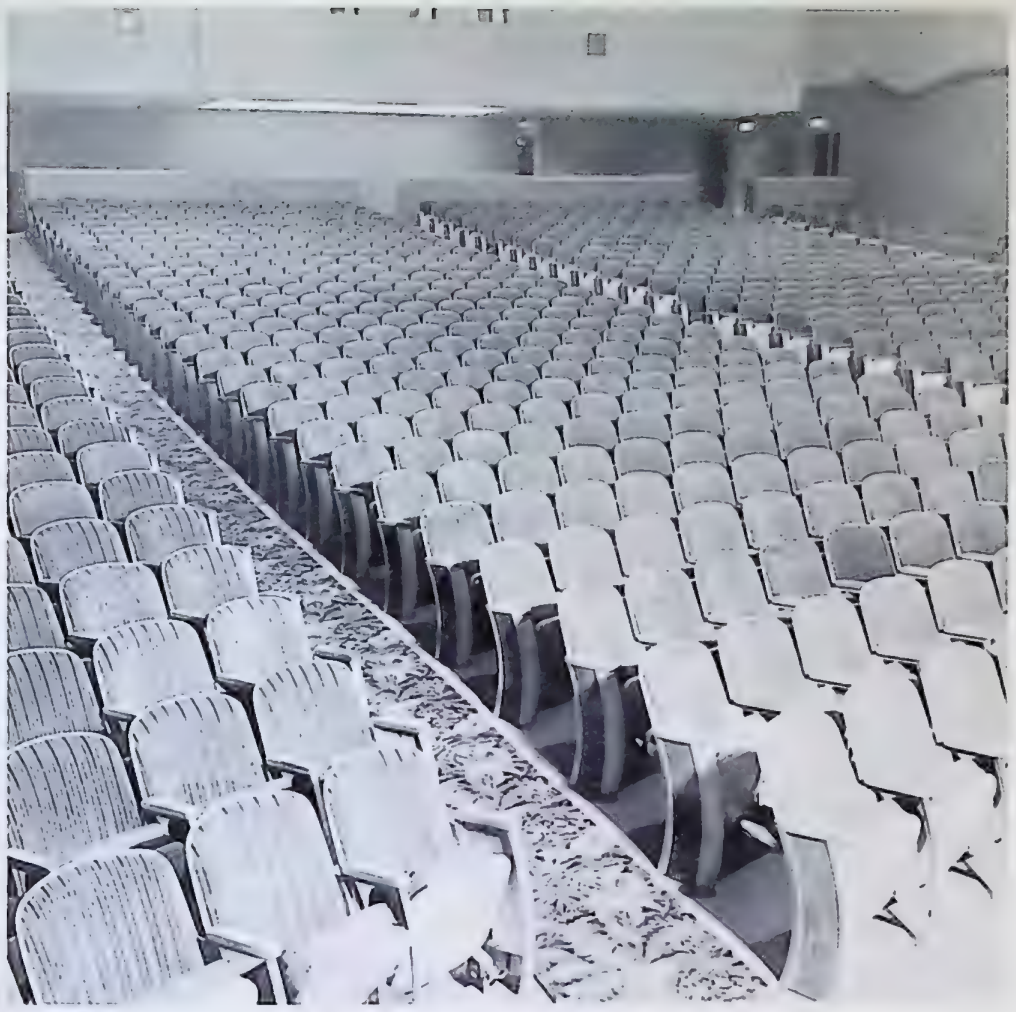
OWNER & OPERATOR: Donta Corp.
ARCHITECT: R. & G. Charbonneau.
SEATING CAPACITY: 950.
COST OF BUILDING: $400,000.
COST OF EQUIPMENT: $80,000.
SIZE OF LOT: 127' x 130'.

Chairs: Heywood-Wakefield Co.
Curtain Controls & Track: Automatic Devices Co.
Generators: Motiograph, Inc.
Projection Lamps: Strong Electric Corp.
Projection Machines: Century Projector Corp.
Screen: Raytone Screen Corp., Astrolite.
Supply Dealer: Dominion Sound Equipments Ltd.



THE MONTROSE is housed in a building constructed of concrete, steel, stone and brick. The front makes the maximum use of the space for display frames and the boxoffice is located in the outer lobby. A good deal of attention has been given to the lighting of the front so that it attracts.







THE INTERIOR of the theatre has concealed lighting throughout. The lobby has walnut panels broken up by large mirrors. The auditorium has been so designed as to focus audience attention on the large CinemaScope screen. All of the draperies and the stage curtains are made out of fibre glass.





MAJESTIC •

Hebron, Nebr.

Constructed on the site of a building that was erected in 1882, the Majestic is a fine example of a small town theatre.

The facing of the building is finished in rose colored brick and limestone. The recessed entrance is covered with pale green structural glass. Radiant heating tubes are imbedded in the concrete sidewalk in front of the building, thus doing away with any snow problem.

Natural stone and combed plywood, finished a dusty rose, were used on the walls of both the foyer and the lobby. A larger mural effectively fronts the entrance wall to the foyer.

The boxoffice and concession stand are built in line so that patrons must pass the refreshment area before entering the theatre auditorium.



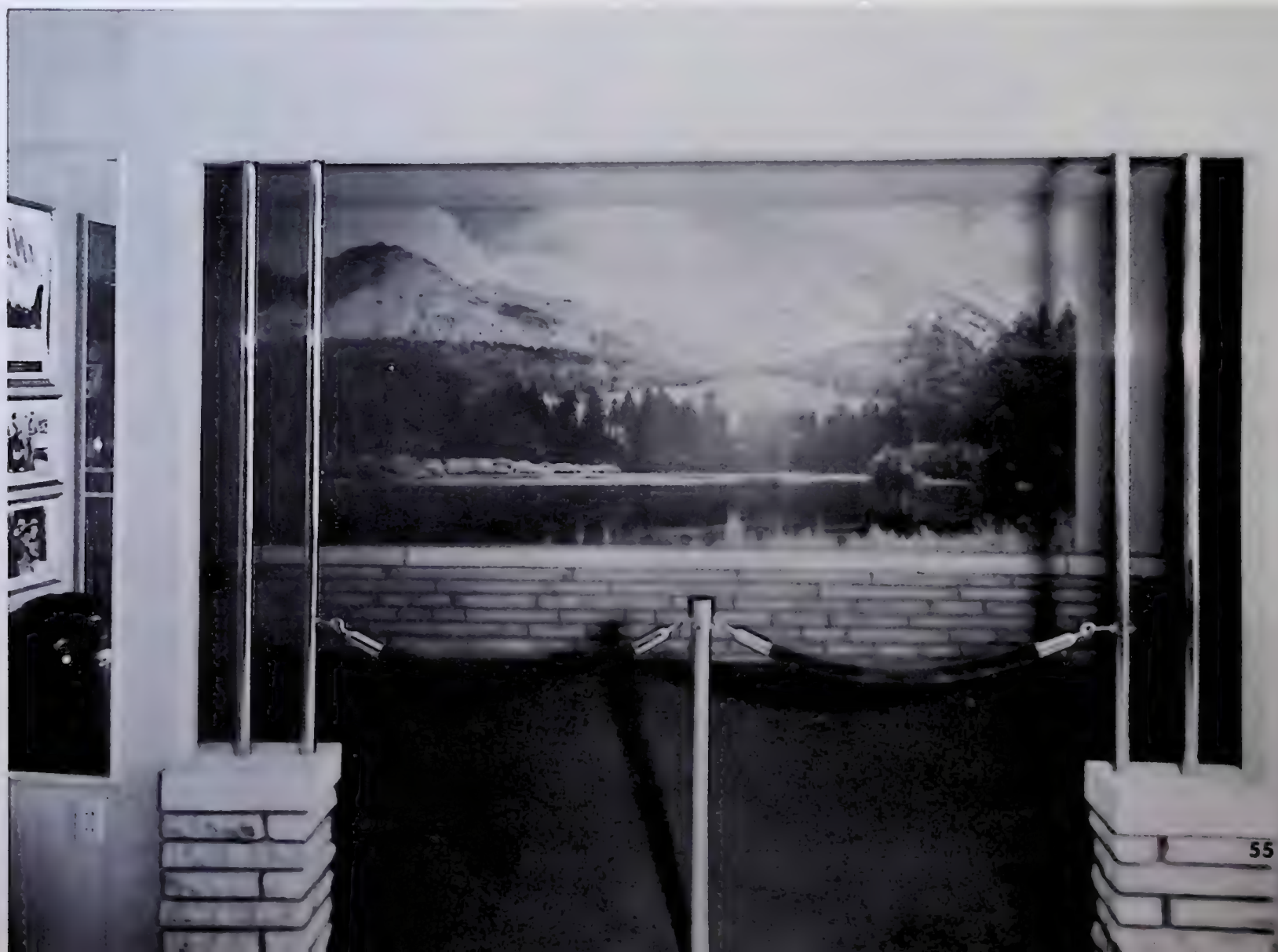


REFERENCE DATA

OWNER & OPERATOR: Howard W. Struve.
ARCHITECT: G. L. Geery.
SEATING CAPACITY: 500.
COST OF BUILDING: $60,000.
COST OF EQUIPMENT (including air conditioning): $40,000.
SIZE OF LOT: 52' x 124'.

Display Frames: Universal Corp.
Projection Lamps: Strong Electric Corp.
Projection Machines: Century Projector Corp.
Rectifiers: Strong Electric Corp.
Rubber Mats: American Mat Corp.
Screen: Raytone Screen Corp.
Sign Letters: Wagner Sign Service, Inc.
Sound: Century Projector Corp.
Supply Dealer: Quality Theatre Supply.

THE AUDITORIUM has 500 seats with pale green upholstery. The color scheme is grey and dusty pink. A large mural adds to the pleasant decor.







CINE TROPICAL •

Acapulco, Mexico

Visitors to the beautiful resort city of Acapulco are sure to be impressed with this 3000 seat indoor theatre that does not have a roof.

The walls of the spacious lobby, done in natural stone, contrast with black vitreous slate of the floor. A long marquee, crowned with tropical plants, highlights the theatre front. The upper part acts as a 73 foot long terrace.

One of the most unusual features of this theatre is the stage which is constructed completely of bamboo, palm trees, and many tropical plants. Set in this exotic surrounding is the motion picture screen.

There are two stairways that lead from the lobby to the 1200 seat first balcony. The second balcony holds space for 300 patrons. The projection booth is located here.

Those customers who are seated in the balcony are given a double dose of entertainment. First, they can view the film program. In addition, from that height it is possible to get a beautiful view of the sky, the sea, and the town.

The problem of air conditioning a theatre of this size was solved by simply eliminating the roof. Since the average temperature for the year is 80 degrees, heating equipment is not necessary.

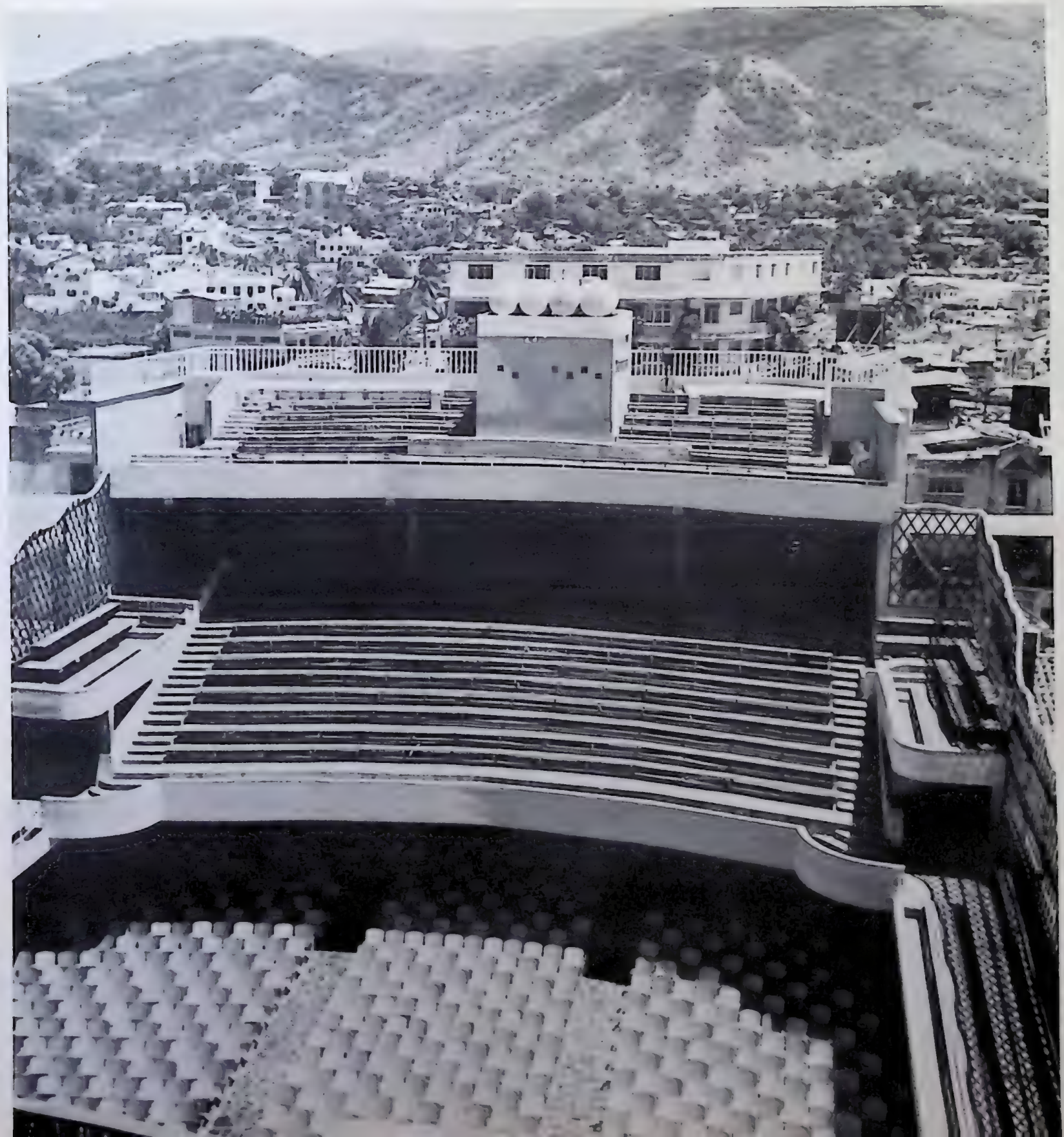
REFERENCE DATA

OWNER: Promotores de Espectaculos, S. A.
OPERATOR: Jose A. Quiroga.
ARCHITECT: Albert Chauvet.
SEATING CAPACITY: 3,000.

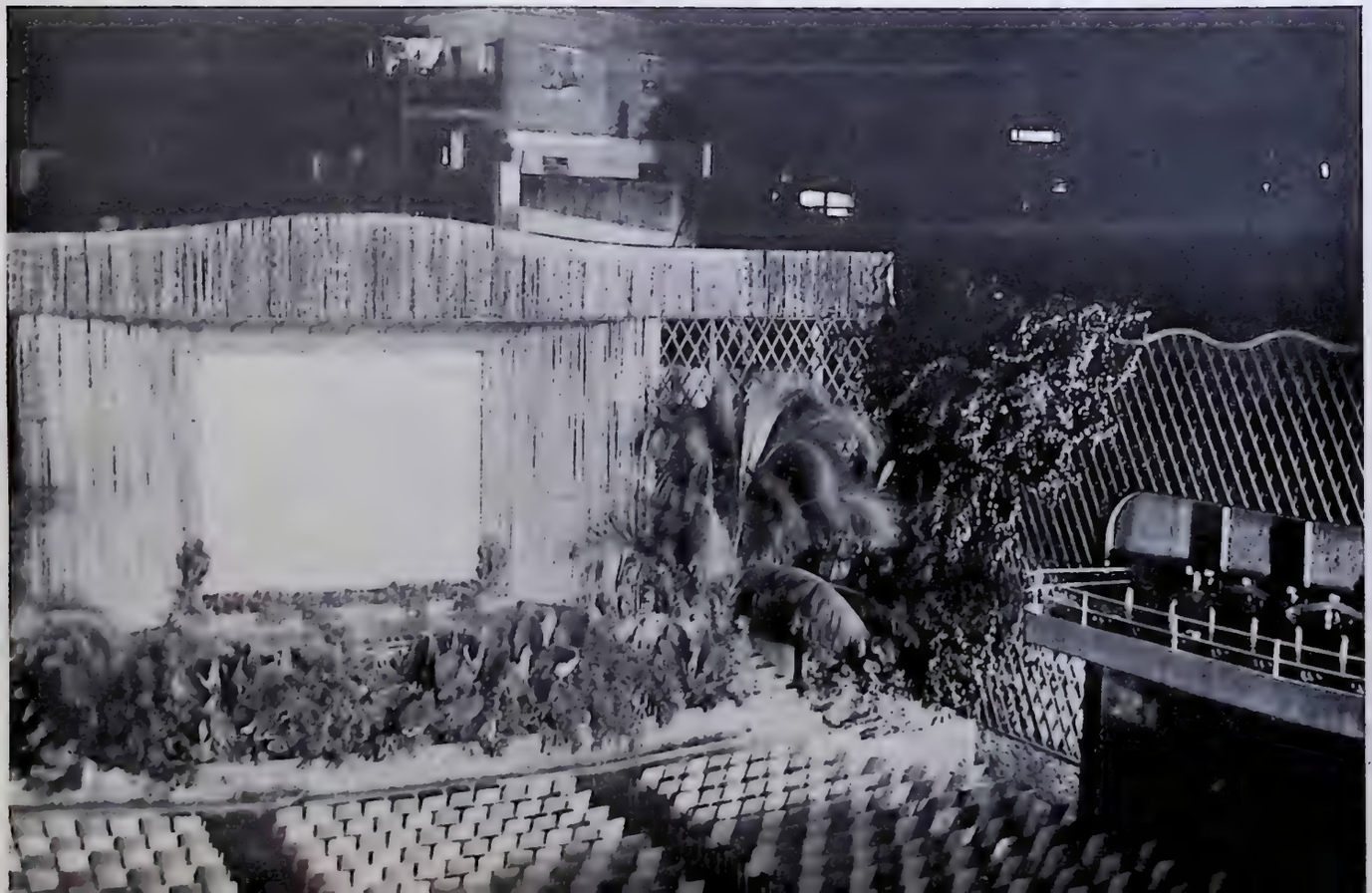
Rectifiers: Strong Electric Corp.
Lenses: Kollmorgen Optical Corp.
Projection Lamps: C. S. Ashcraft Mfg. Co.
Projection Machines: International Projector Corp., Simplex.
Sound: International Projector Corp.
Supply Dealer: Cine—Mex, S. A.



THE SPACIOUS lobby is of ample proportions to handle the 3000 seat capacity of this theatre. Since the Cine Tropical does not have a roof, balcony patrons get a beautiful view of the city.



THERE IS very little trouble encountered from the weather at this roofless theatre since, except for a short rainy season, the area has perfect climate. Even during the rainy season it is seldom necessary to miss the performance since it usually rains either before or after the program.





FILM CENTRE •

Baltimore, Md.

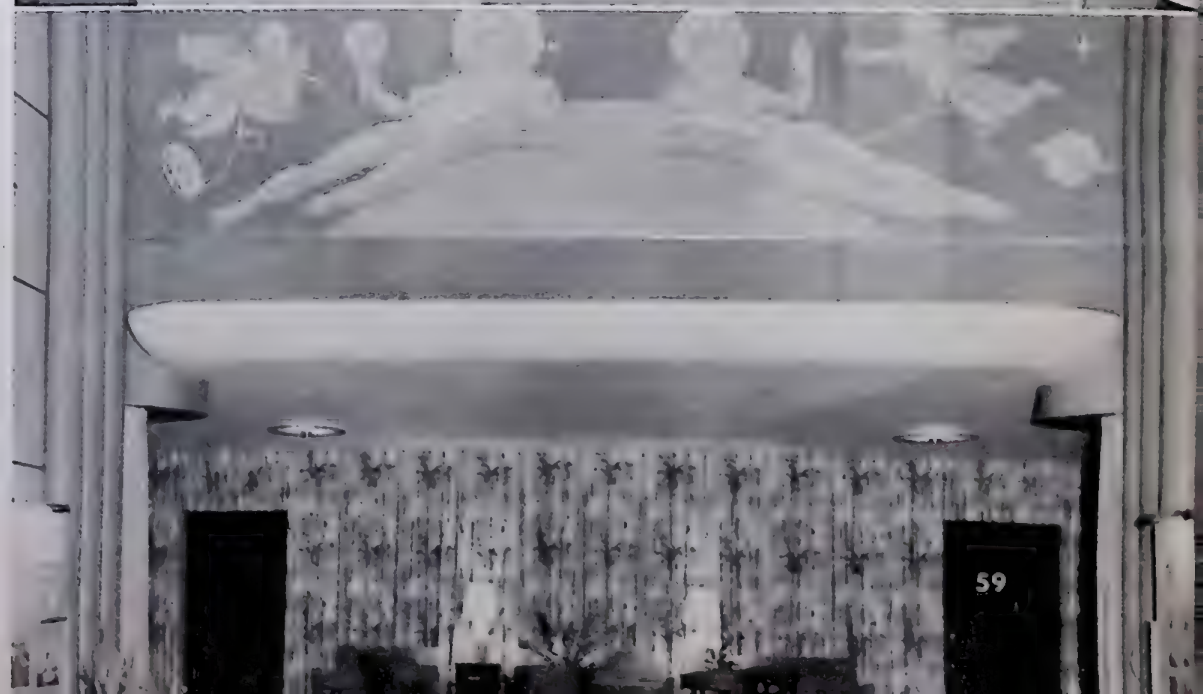
One of the finest examples of a theatre remodeling job can be seen by paying a visit to the Film Centre.

The theatre was taken over by a local exhibitor who decided to turn the house into an ultra-modern art film outlet.

Patrons upon entering the inner lobby are presented with a view of an impressible mural depicting the functions of night and day. The back wall of the lobby is covered with full length drapes in a bright floral pattern. A grouping of modern furniture makes this a fine place to wait for friends.

The lobby of this 960 seat theatre has been decorated in a modern up-to-date fashion. One of the most popular features of the house is the counter where free hot coffee is distributed by charming hostesses. There are also art exhibits' features, and when possible these exhibits tie-in with the feature theme.





REFERENCE DATA

OWNER: Morris Mechanic-Lessor.
OPERATOR: Cinema Centre Theatre Co., Inc..
SEATING CAPACITY: 960.
Chairs: American Seating Co.
Screen: Walker-American Corp.
Sign & Marquee: Triangle Sign Co.
Sign Letters: Adler Silhouette Letter Co.
Sound: RCA.
Supply Dealer: National Theatre Supply.



CARSON •

Carson City, Nev.

Representing an investment of $115,000, the Carson Theatre has been designed and equipped so that the inhabitants of the small town in which it is located, may enjoy all of the recent advances made in projection and sound, and in surroundings that make going to the theatre a rewarding use of leisure time.

The front of the theatre has been done in ceramic tile, and the color combination is green with yellow borders.

A warm shade of old rose has been used in the lobby and foyer with a green figured carpet furnishing the contrast. The concession stand is constructed of natural wood, and the floors around this area have been covered with alternating squares of red and green asphalt tile.

The auditorium has light green plastered wide walls while the back has been done in white acoustic tile. The latest seating has been used and consists of 584 chairs in the main part of the auditorium, 64 spring base loge chairs and 15 seats in the cry room.

Projection and sound equipment includes a 42-foot wide screen, and stereophonic sound.

A complete heating and air conditioning system adds to patron comfort.

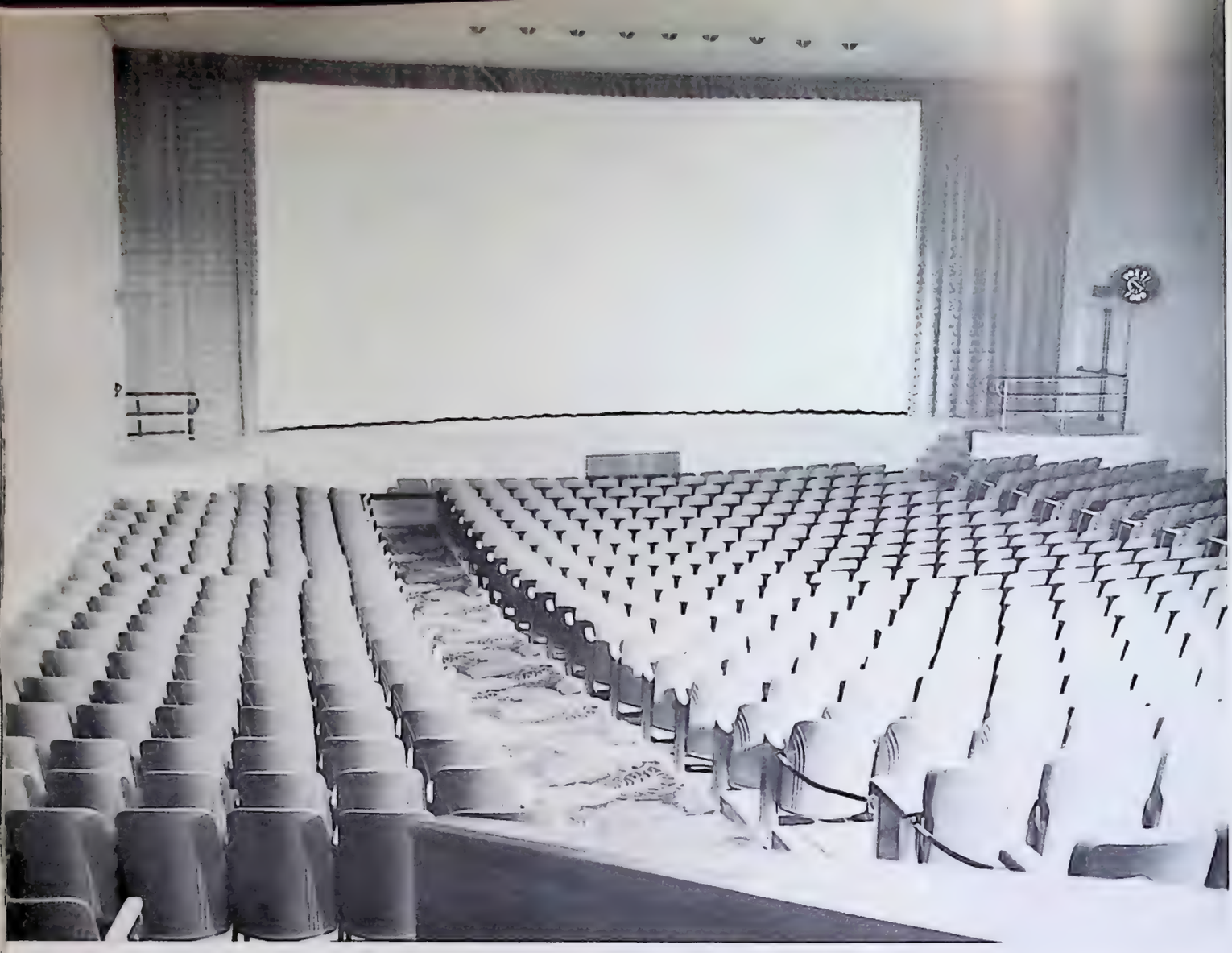
REFERENCE DATA

OWNER & OPERATOR: Carson Theatre Co.
ARCHITECT: Vincent G. Raney.
SEATING CAPACITY: 679.
COST OF BUILDING: $115,000.
COST OF EQUIPMENT (including air conditioning): $35,000.
SIZE OF LOT: 63' x 130'.

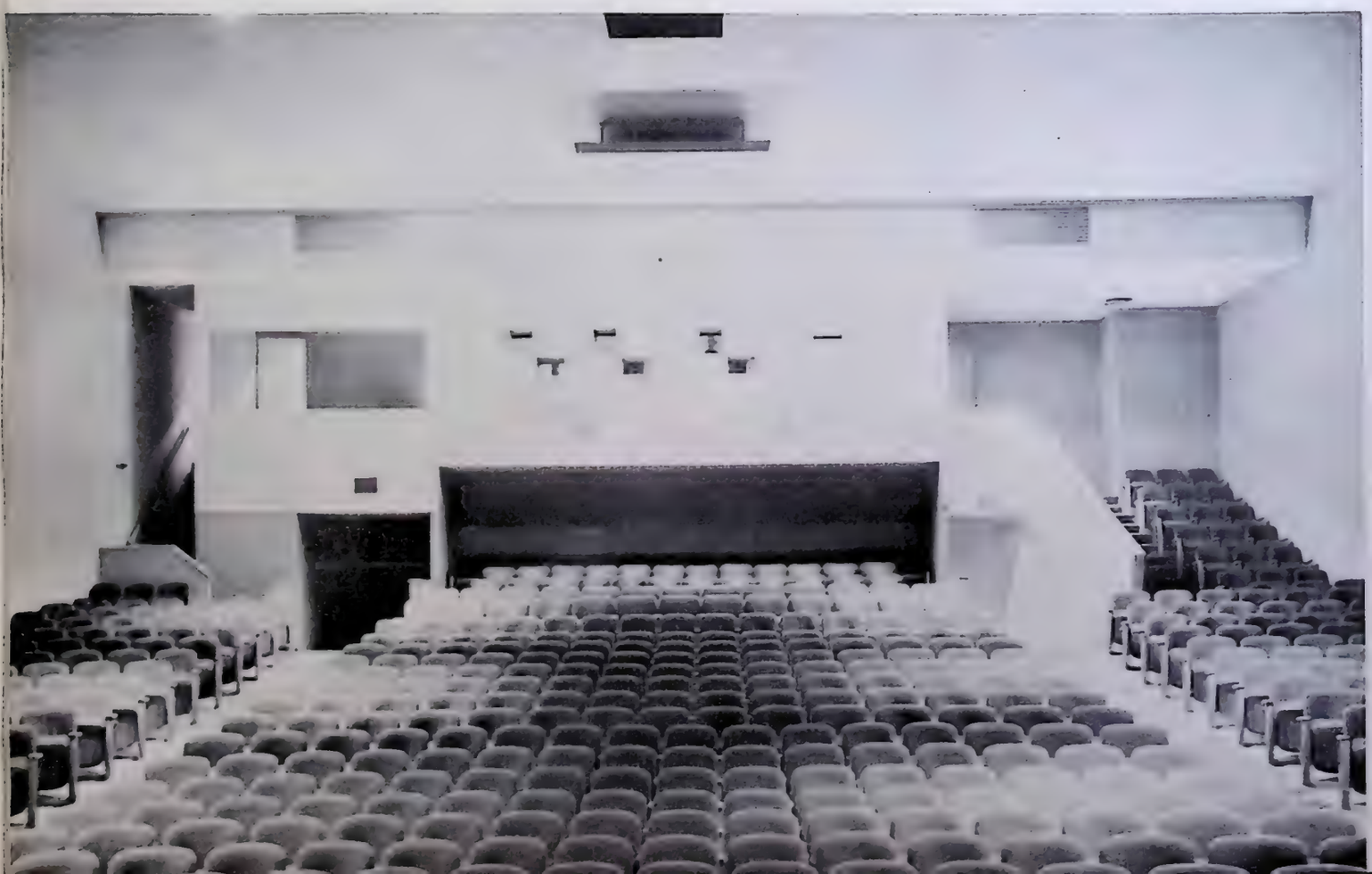
Chairs: Heywood-Wakefield Co.
Curtain Controls & Track: Automatic Devices Co.
Display Frames: Universal Corp.
Rectifiers: Kneisley Electric Co.
Lenses: Bausch & Lomb Optical Co.
Projection Lamps: Strong Electric Corp.
Projection Machines: Motiograph, Inc.
Rewinders: GoldE Mfg. Co.
Rubber Mats: B. F. Shearer Co.
Screen: Raytone Screen Corp., Astrolite.
Sign Letters: Wagner Sign Service, Inc.
Sound: Magnasync.
Supply Dealer: B. F. Shearer Co.




CANDY
FRI SAT
Walt Disney



FEATURING the finest equipment available for the showing of wide screen productions, the Carson also offers its audiences seating that combines comfort with luxury. A Cry Room has also been made available for those patrons with children who wish to make use of this extra service.



FITCHBURG •

Fitchburg, Mass.

As a result of a complete remodeling job this theatre is now as modern in its physical appearance as the films shown.

The central boxoffice was moved to the side, and an indirect-lighted marquee installed with new lights in the ceiling outside the lobby. The wood-paneled side wall is in ranch-style, and painted a rich dark brown, replacing the stone post that was formerly there. Glass doors and windows completed the remodeling of the front.

The ranch-type wall paneling was carried into the inner lobby, and large modernistic display panels replaced the small heavily ornate one formerly used. Up-to-date lighting fixtures were also installed.

In an attempt to increase the extra profits activities of the theatre, which had formerly sold only candy, a large and fully equipped new concession stand was installed. Included among this equipment was a popcorn machine, a three-flavored drink dispenser, an ice cream container, and electric hot dog rotisserie, nuts, and a complete line of candy.





REFERENCE DATA

OWNER: Kenmore Realty.
OPERATOR: Ben Sack.
ARCHITECT: Louis Chiaramonte.
SEATING CAPACITY: 1,750.

Lenses: Bausch & Lomb Optical Co.
Projection Lamps: Strong Electric Corp.
Projection Machines: Century Projector Corp.
Rectifiers: J. E. Robin, Inc.
Screen: Raytone Screen Corp., Astrolite.
Sign Letters: Wagner Sign Service, Inc.
Sound: International Projector Corp.
Supply Dealer: Mass. Theatre Equip. Co.

THIS 1750 seat house, which was built 25 years ago has been completely remodeled and given a new atmosphere of modernity and luxury as well.







PLAZA

Vernon, Tex.

Located in the center of town this 1204 seat theatre has an attractive front made of a random pattern mosaic tile. The aluminum display cases are equipped with fluorescent lights.

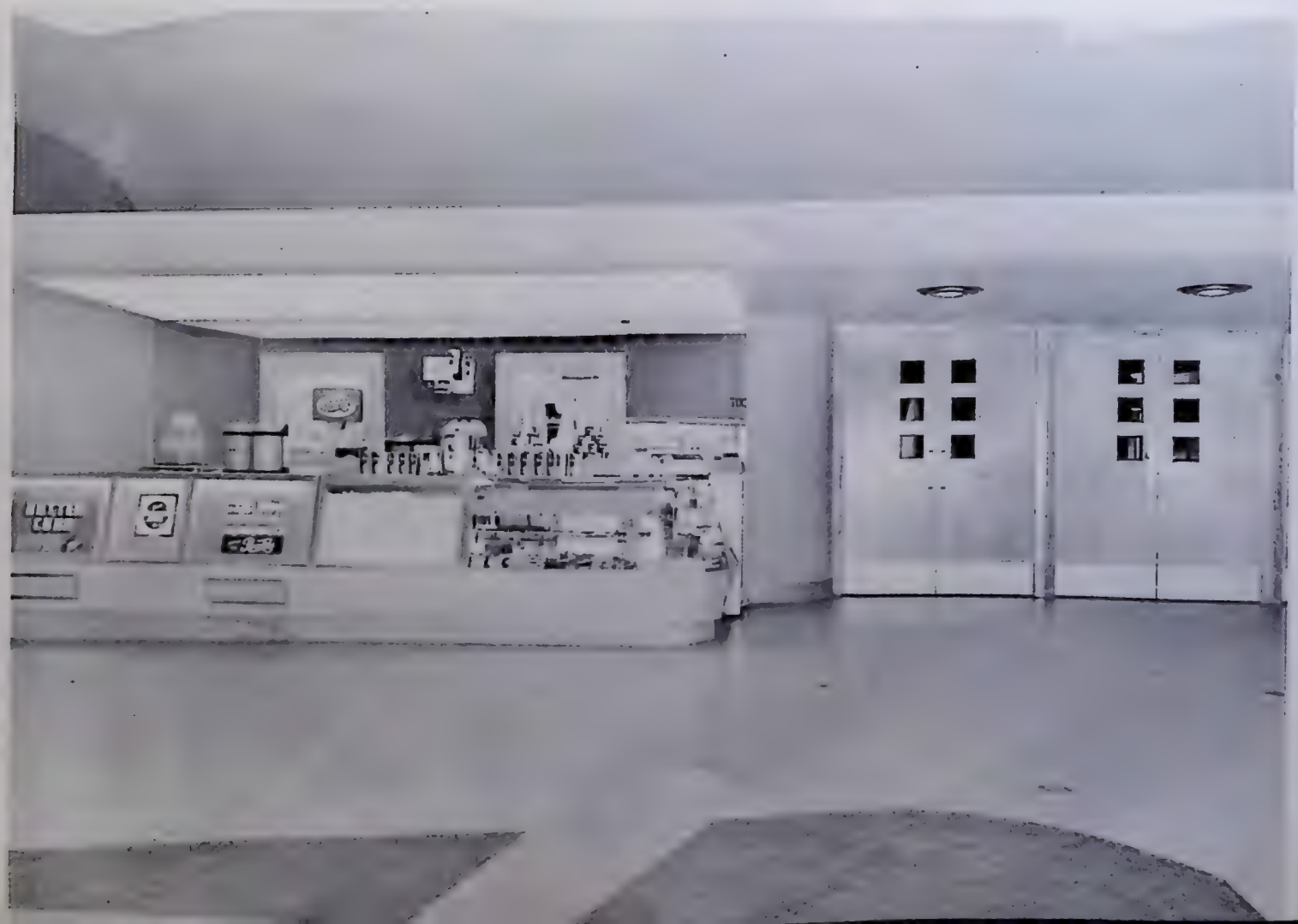
The lobby is done in a soft shade of red while the ceiling, which is made of acoustical plaster, is a light green. The auditorium ceiling is of red acoustical plaster, with sprayed walls and ceiling for sound diffusion. The walls are covered with two types of acoustic board and painted light green with a darker wainscot as contrast.

The foyer has a green terrazzo floor that is accentuated by red and black patterns. Eggcrate fluorescent lighting has been used throughout the area.

REFERENCE DATA

OWNER & OPERATOR: Texas Consolidated Theatres, Inc.
ARCHITECT: Jack Corgan.
SEATING CAPACITY: 1,204.
SIZE OF LOT: 180′ x 110′.

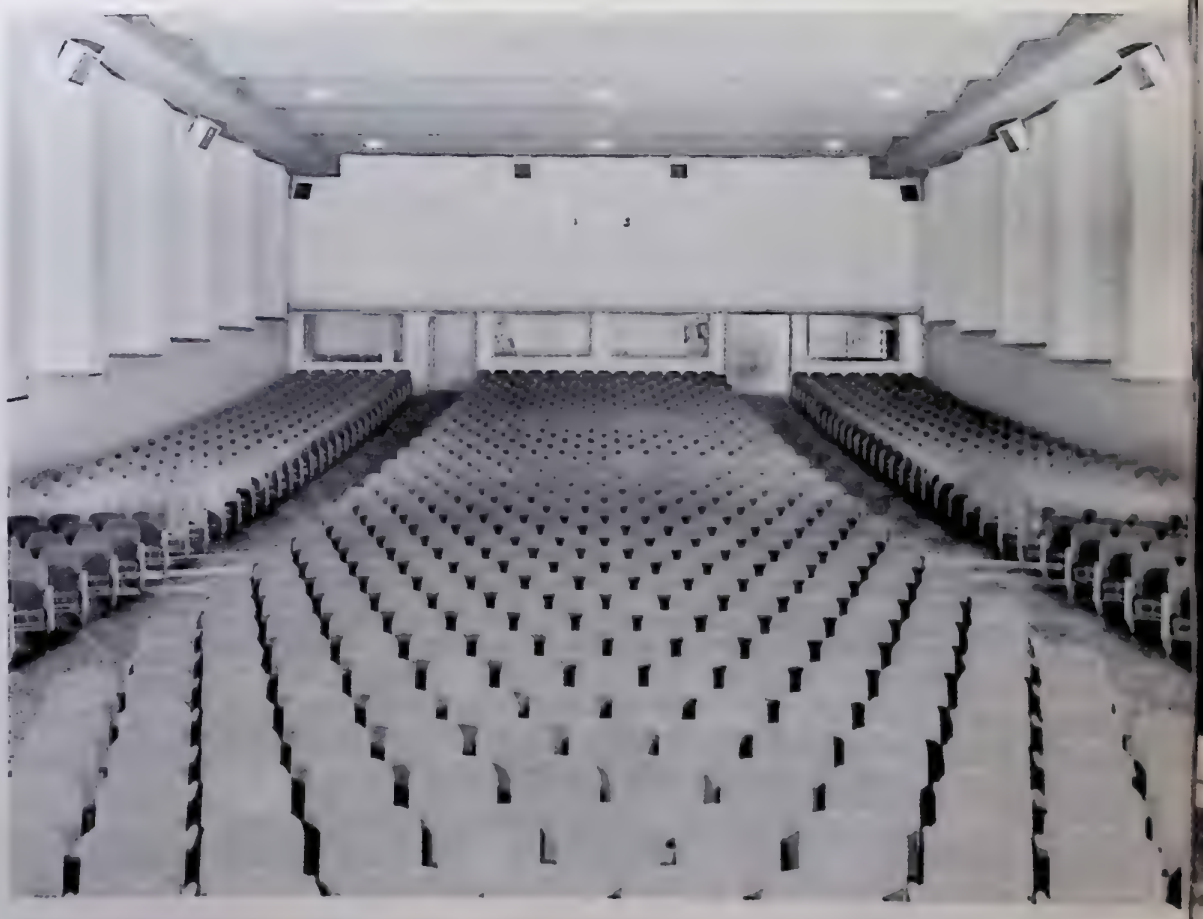
Carpets: Alexander Smith & Sons.
Curtain Controls & Track: Vallen, Inc.
Display Frames: Universal Corp.
Film Cabinets: Goldberg Bros.
Generators: RCA.
Lenses: Bausch & Lomb Optical Co.
Projection Lamps: RCA.
Projection Machines: RCA.
Screen: Walker-American Corp.
Sign Letters: Adler Silhouette Letter Co.
Sound: RCA.
Supply Dealer: Sterling Sales & Service.

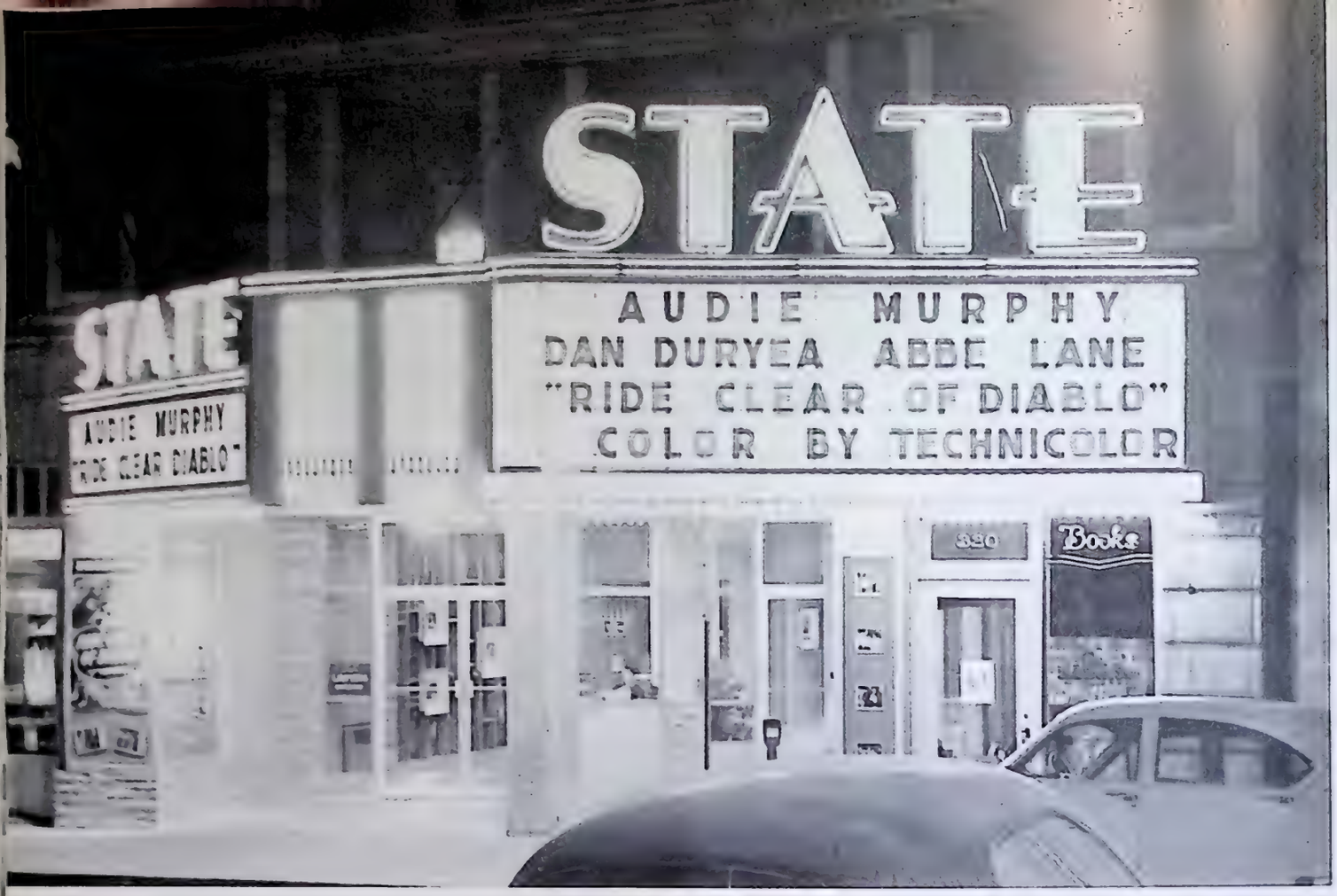




THIS theatre has among its many features an auditorium which has been designed for the requirements of stereophonic sound. Another extra is the Cry Room which will hold 12 customers.







STATE •

Raleigh, N. C.

Originally constructed 30 years ago, this theatre was completely transformed into an almost new structure.

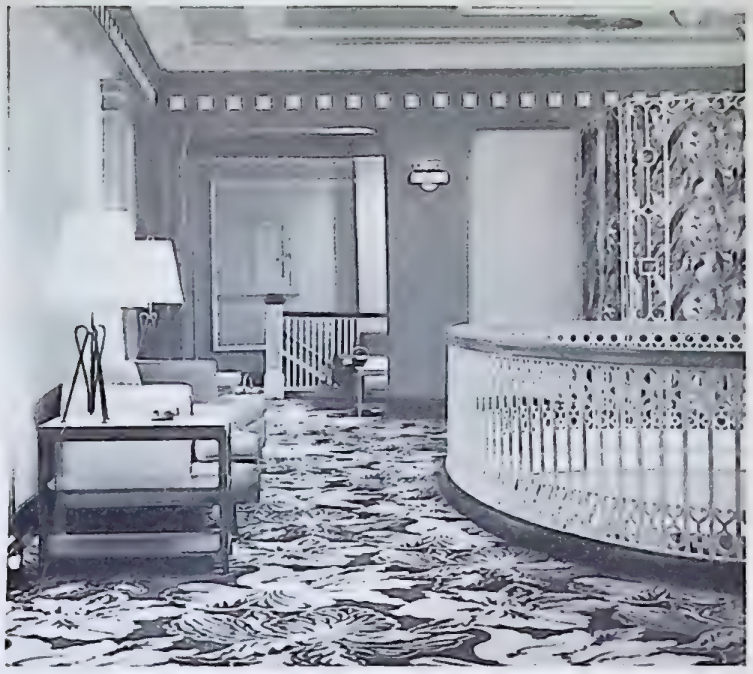
The front, lobby and entrance were changed to conform with modern architectural thinking. The interior was completely redecorated, including a new seating scheme, new concealed lighting controlled by a dimmer, increased lounge space, and a new air-conditioning system.

A large 46-foot CinemaScope screen was installed out in front of the stage, and automatically controlled wall-to-wall turquoise satin draperies.

By taking a former supply room, just off the foyer on the main floor, a new entrance to the men's room was obtained, as well as a smoking lounge which the house did not have prior to remodeling.







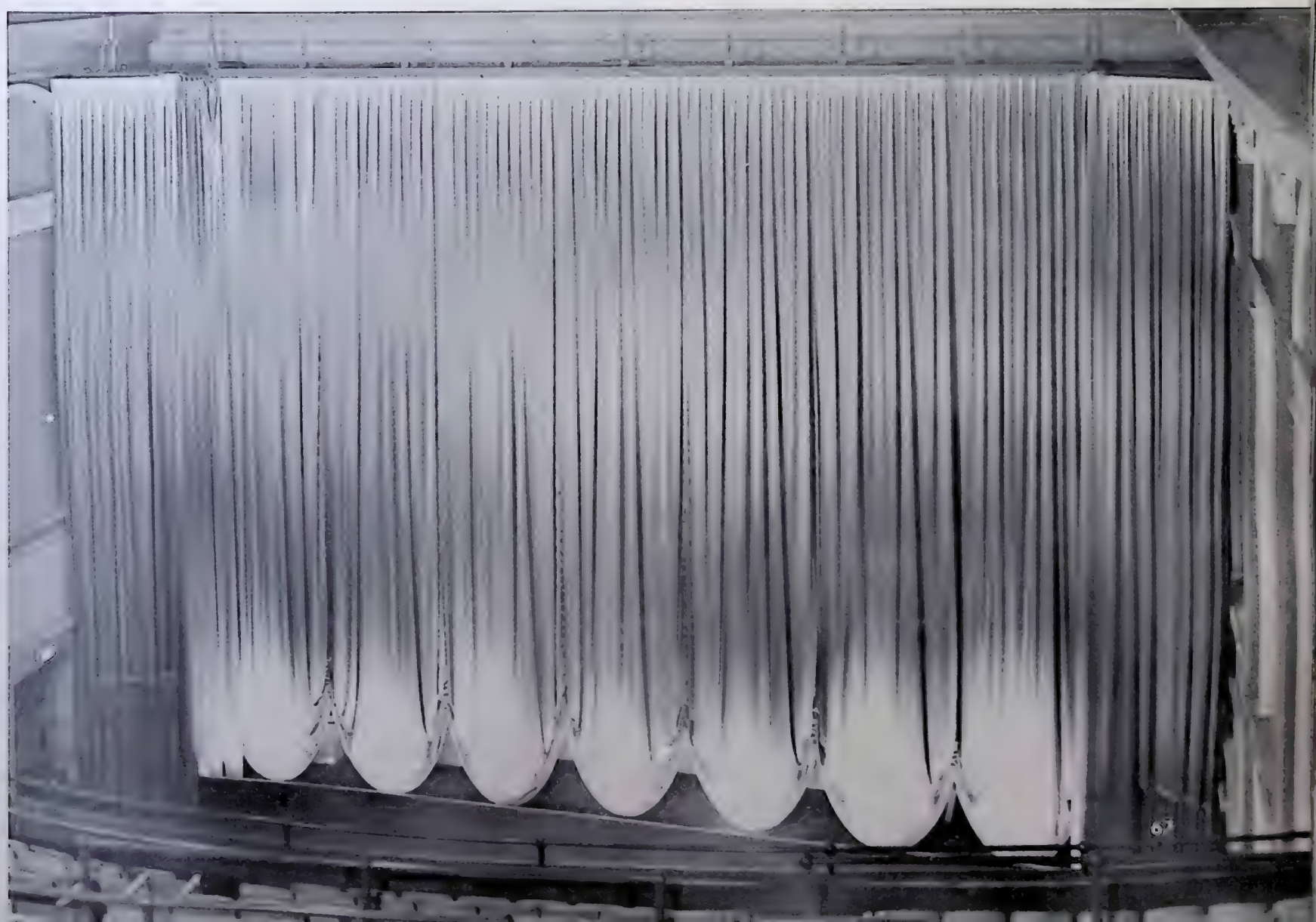


REFERENCE DATA

OWNER & OPERATOR: Key Theatres, Inc.
ARCHITECT: E. H. Geissler.
SEATING CAPACITY: 1,035.

Carpets: A. & M. Karagheusian.
Chairs: Heywood-Wakefield Co.
Curtain Controls & Track: Automatic Devices Co.
Display Frames: Universal Corp.
Lenses: Bausch & Lomb Optical Co.
Projection Lamps: C. S. Ashcraft Mfg. Co.
Projection Machines: Motiograph, Inc.
Rectifiers: C. S. Ashcraft Mfg. Co.
Sign Letters: Wagner Sign Service, Inc.
Sound: Western Electric.
Supply Dealer: Wil-Kin Theatre Supply, Inc.
Ticket Issuing Machine: General Register Corp.

AS A RESULT of the remodeling, lounge space was increased 50 per cent. Natural finish furniture was used in the mezzanine lounge. The auditorium was also given an entirely new look in the redecorating job which cost $100,000. The wide screen is offset by the open drapes.





CHICAGO •

Chicago, Ill.

One of the most important remodeling jobs recently understaken was the key house in the B and K chain, the Chicago.

This center city palace had all of the ornaments removed from its front. Making use of bronze, marble and stainless steel, new doors, poster cases and box-office were installed. In addition, fluorescent lighting was put in, as well as modernization of the large marquee.

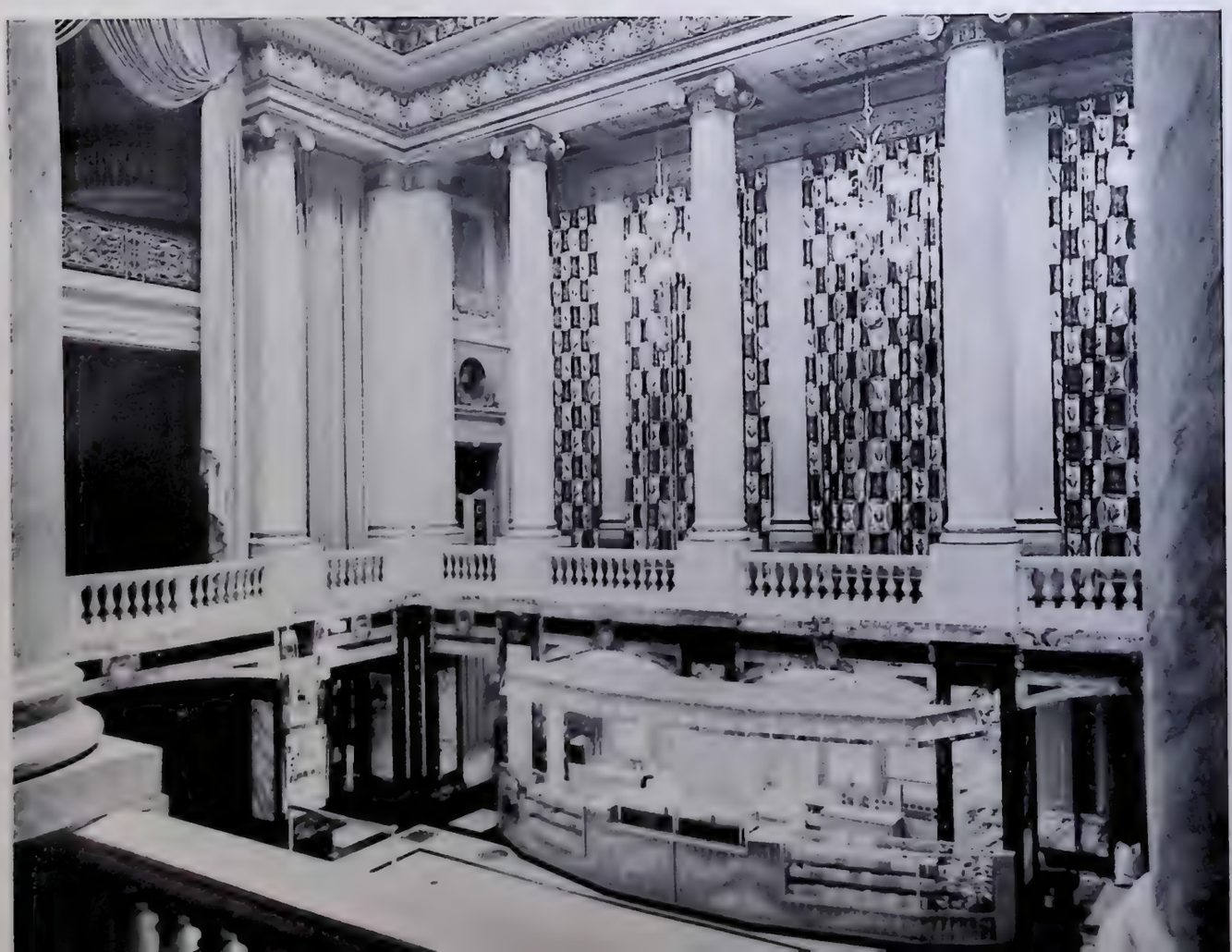
One part of the house which was given a complete new look was the lower mezzanine. This room has been patterned after a New Orleans garden. The decor consists of red brick, several full length mirrors on either wall and a polished tile floor inlaid with bright designs. Fabric covered wrought iron chairs and built-in settees have been supplied.

Most of the theatre furniture was replaced by custom-built lounge chairs, settees, etc. Also, more than 300 original lighting fixtures were installed.

REFERENCE DATA

OWNER & OPERATOR: Balaban & Katz Corp.
ARCHITECT: Rapp and Rapp.
SEATING CAPACITY: 4,000.

Decorator: Hanns R. Teichert Co.
Lighting Fixtures: Harry L. Winograd.
Sign Letters: Wagner Sign Service, Inc.
Ticket Issuing Machine: General Register Corp.



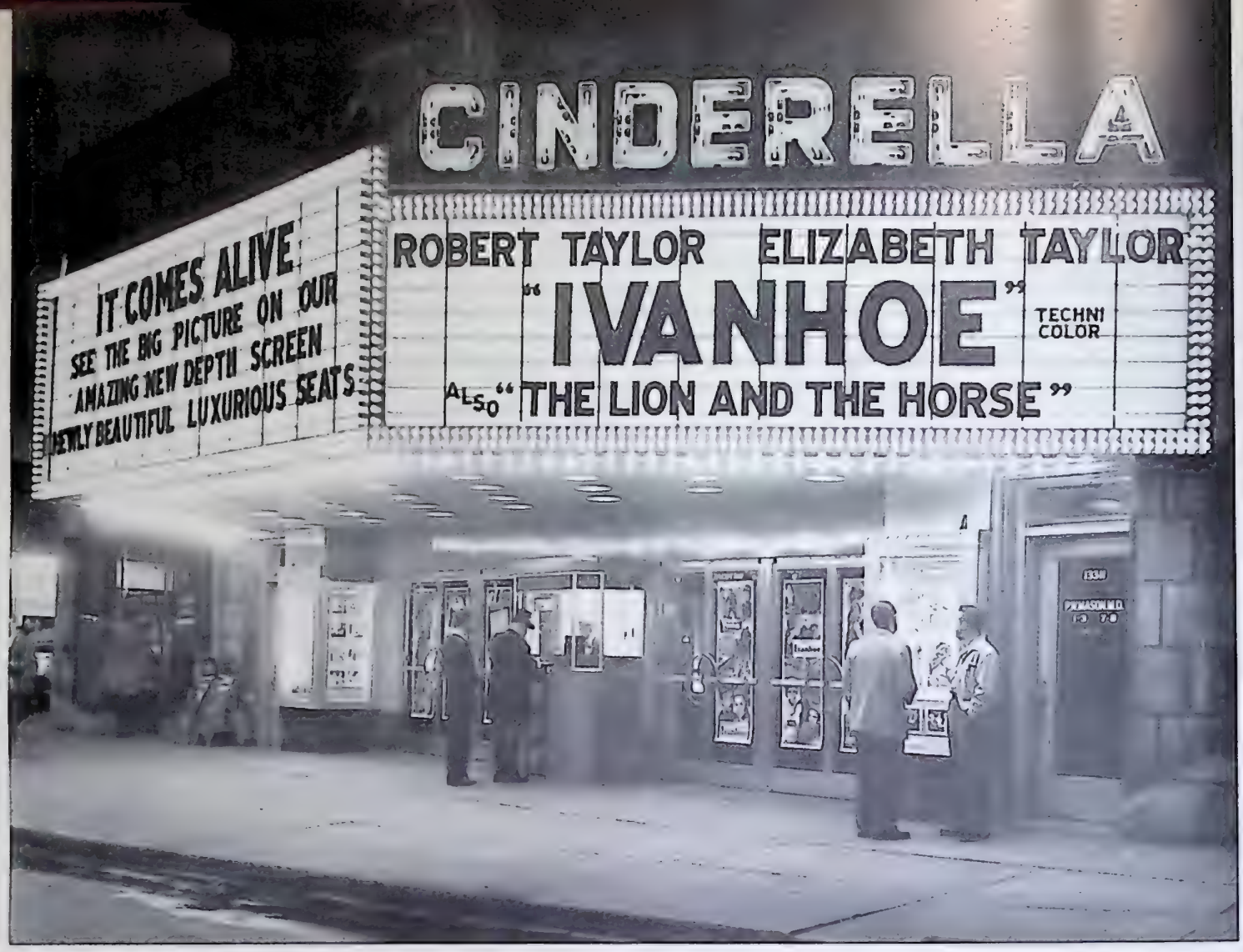


THE LOWER mezzanine was designed to give the impression of a New Orleans garden. Throughout the entire house excess ornaments were removed and replaced by modern draperies and new custom-built furniture to achieve the new look.









CINDERELLA •

Detroit, Mich.

This 1500 seat house was recently given a thorough job of modernization that took eight months to complete.

The auditorium, foyer and lobby were redone in a modern motif. A new candy bar was installed with decorations in the background accented by chrome and deep rose. The marquee was streamlined and other exterior effects included a newly decorated boxoffice and glass and metal exit doors. The dominant color in the wall decorations, ceiling and lobby pillars was Dubonnet in blending tones, while the patterned carpet utilized scarlet, gold and black for contrast.

Restrooms were also revitalized, the men's room being finished with sand colored tile on the walls and sand colored floor tile in the toilet room, and a similar color plastic tile in the smoking room. The ladies' toilet room was finished with coral colored tile.

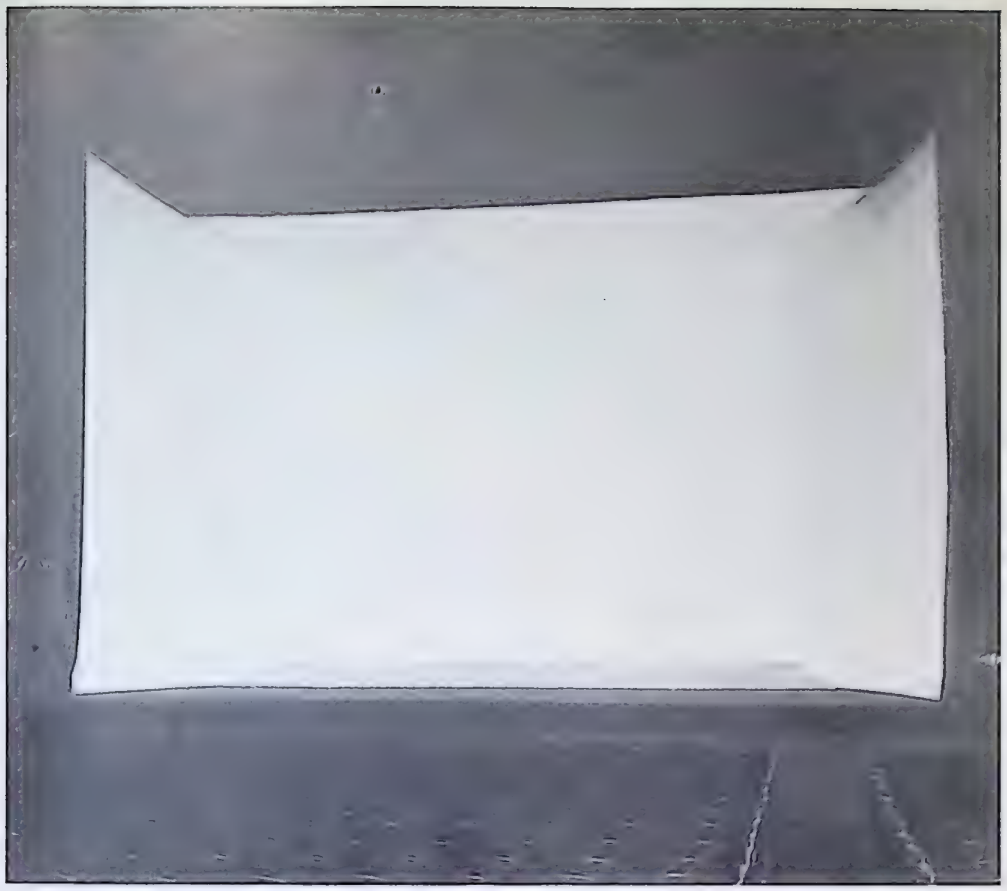
The auditorium was reseated.

REFERENCE DATA

OWNER: James Robertson.
OPERATOR: United Detroit Theatres.
SEATING CAPACITY: 1,497.

Chairs: International Seat Co.
Projection Lamps: Strong Electric Corp.
Projection Machines: RCA.
Screen: Walker-American Corp.
Sign Letters: Adler Silhouette Letter Co.
Sound: RCA.
Supply Dealer: "Ernie" Forbes Theatre Supply.







A 32 FOOT candy counter was built on one side of the lobby making use of white trim and mirrors. The auditorium was reseated to improve comfort and sight lines, and interior brightly painted.





FOX •

Sidney, Nebr.

Making excellent use of the quonset type of design, this theatre is constructed primarily of brick and laminated timbers.

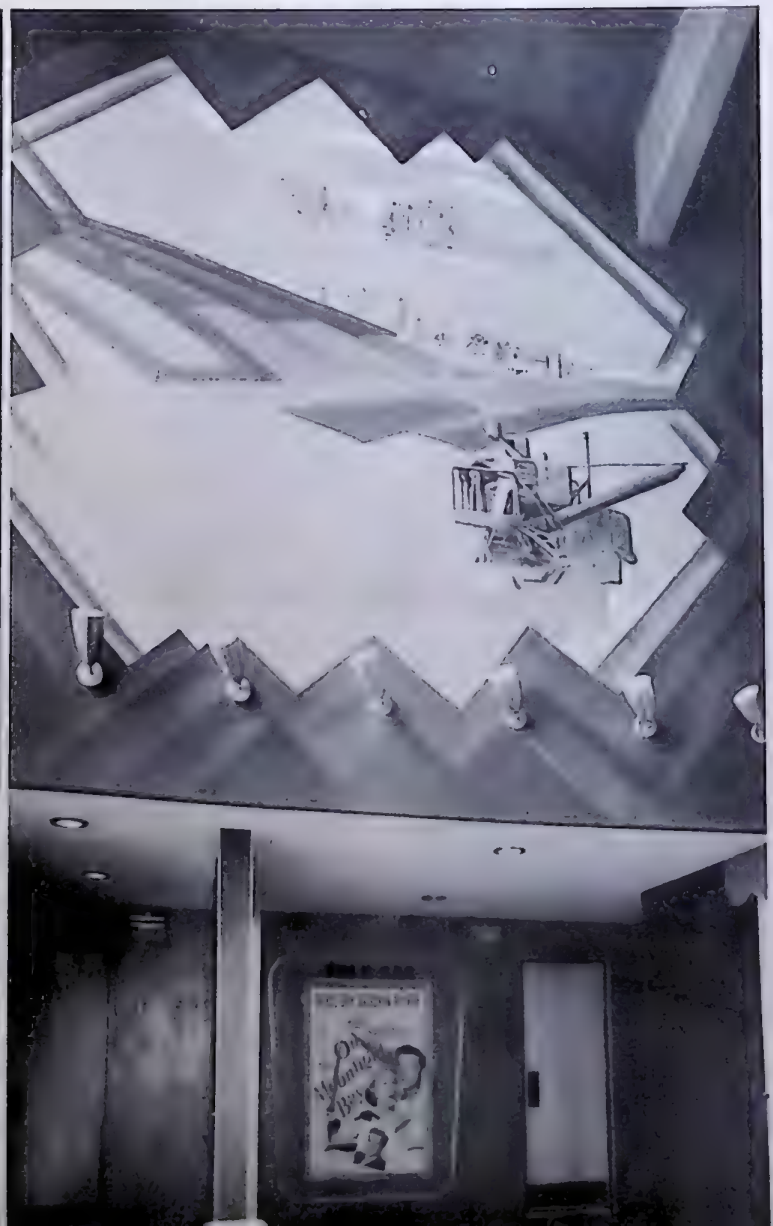
The interior decor is highlighted by the large laminated wood trusses stained dark brown. The rest of the color scheme is lime green, ivory and coral.

The walls of this theatre are made of one-eighth inch cork and plaster, including the lounge which also have tile floors.

One of the unusual features of this house is the projection booth which has been built directly over the concession bar. The lobby wall has been replaced by large windows enabling people to see directly into the booth.

The lobby has interesting murals depicting the state's main industries.





SEATING 950 this theatre has many attractive and unusual design features. The quonset design is both pleasing to the eye and has many safety factors. The projection booth is open and can be viewed by patrons, and may also be seen by passersby in the street. It helps attract trade.



REFERENCE DATA

OWNER & OPERATOR: Fox Inter-Mountain Amusement Corp.
ARCHITECT: C. D. Strong.
DESIGNER: M. C. Glatz.
SEATING CAPACITY: 950.
COST OF BUILDING: $96,600.
COST OF EQUIPMENT (including air conditioning): $39,000.

SIZE OF LOT: 60' x 132'.

Carpets: Alexander Smith & Sons.
Draperies & Stage Curtains: Great Western Stage Equip. Co.
Lenses: Bausch & Lomb Optical Co.
Projection Lamps: J. E. McAuley Mfg. Co.
Projection Machines: RCA.

Rectifiers: Strong Electric Corp.
Rewinders: Goldberg Bros.
Screen: RCA.
Sign Letters: Theatre Specialties, Inc.
Sound: RCA.
Supply Dealer: National Theatre Supply, Western Service & Supply.
Ticket Issuing Machine: General Register Corp.



CENTURY'S PROSPECT •

Flushing, L. I., N. Y.

This theatre underwent an extensive remodeling job that took a month to complete, and during which the theatre closed.

A new marquee sign was installed and stainless steel display cases replaced the wooden ones. The boxoffice was refinished in stainless steel and glass doors put in.

All plaster ornamentation was removed from the foyer, and recessed lights installed. A new candy bar with an oak formica finish was put in, as well as new carpeting, and freshly painted walls.

In the auditorium old veneer backed chairs were removed from the orchestra and replaced with push-back models. Balcony and loge seats were also replaced. Old return air mushrooms were removed from the orchestra floor and new return air grilles installed in the side walls.

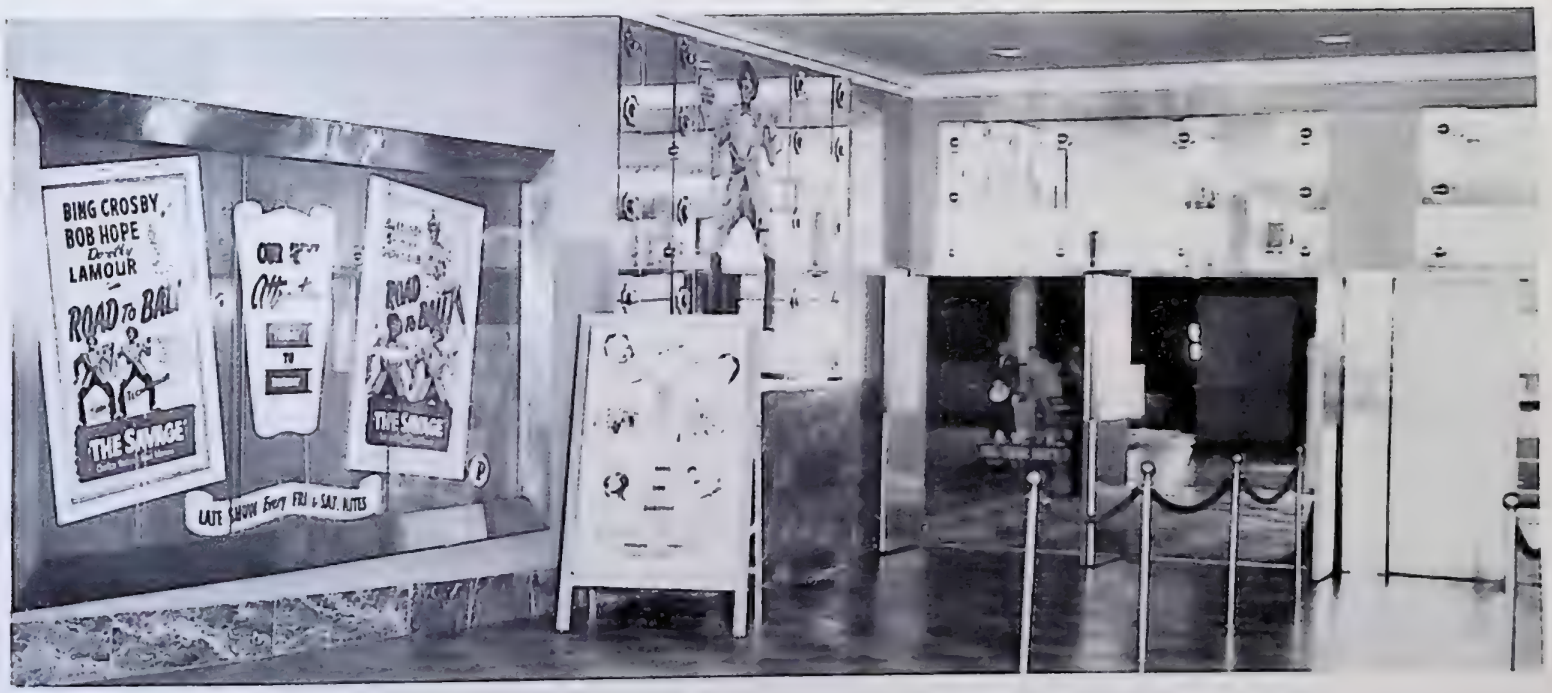
In order to show the new systems a 44-foot CinemaScope screen was installed, full stereophonic sound equipment and theatre television.

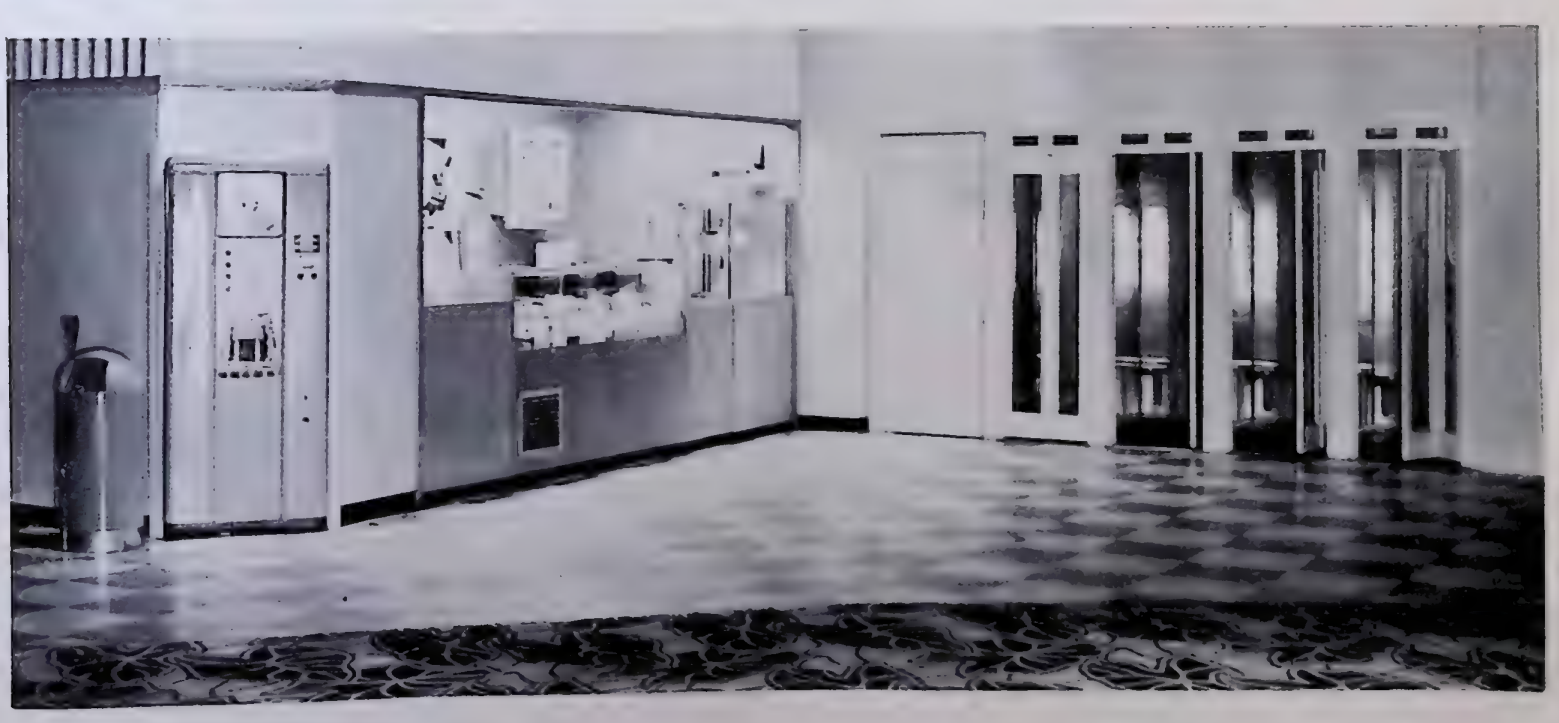


REFERENCE DATA

OWNER & OPERATOR: Century Theatres.
ARCHITECT: John J. McNamara.

Carpets: Thomas L. Leedom.
Chairs: American Seating Co.
Generators: Hertner Electric Corp.
Projection Machines: International Projector Corp., Simplex X-L.
Screen: Walker-American Corp.
Sign: Claude Neon Products, Inc.
Sound: RCA.
Theatre TV: RCA.
Ticket Issuing Machine: General Register Corp.







NEW MOON TWIN DRIVE-IN •

Lake Charles, La.

The New Moon Twin Drive-In was constructed at a cost of $250,000. It has a car capacity of 1000. In addition there is a 400 seat centrally heated auditorium for those persons who either arrive on foot, or do not wish to see the program from their automobile. There is also a patio with facilities for 150 persons.

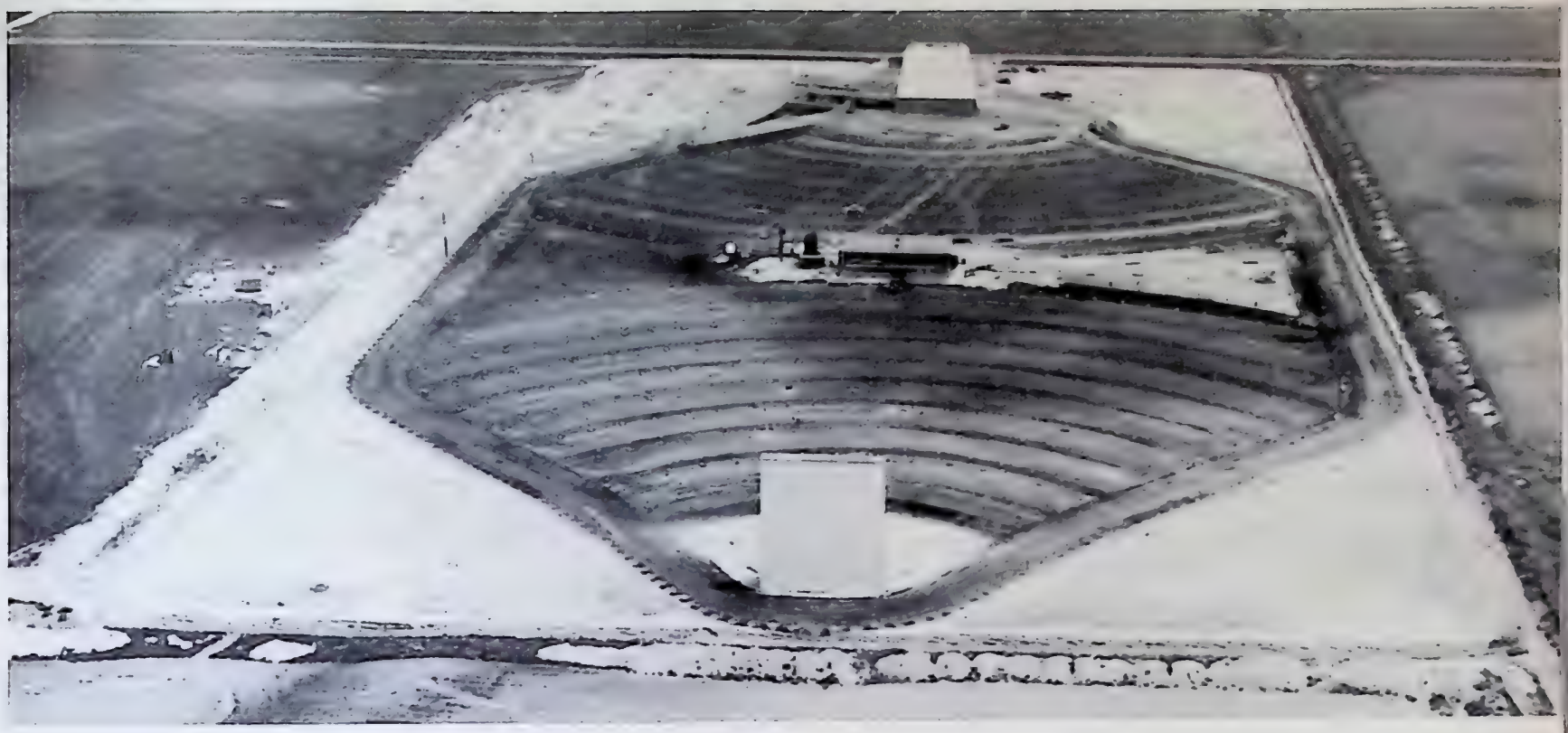
Front name facing material is of corrugated aluminum and redwood painted in dark blue, red and yellow. Neon tubing has been used to outline the moon and stars. The boxoffice is constructed of redwood and glass.

There is a large concession building in which it is possible to obtain such things as fried chicken, grilled hamburgers, etc.

The playground is fully equipped with mechanical and standard equipment.

THE NEW MOON Twin Drive-In is one of the best examples of an outdoor theatre making use of twin screens. The operator believes that this type of arrangement has many advantages, one of which is catering to those persons who only wish to see one feature and leave without inconvenience.





REFERENCE DATA

OWNER: Open Air Theatres, Inc.
OPERATOR: Walter Guarino.
ARCHITECT: Gabriel & Reames.
CAR CAPACITY: 1,000, 400 seats.
COST OF BUILDING & EQUIPMENT: $250,000.

Generators: Century Electric Co.
In-Car Speakers: RCA.
Playground Equipment: Miracle Whirl Sales Co.
Projection Lamps: RCA.
Projection Machines: RCA.
Sign & Marquee: Wagner Sign Service Co.
Sign Letters: Wagner Sign Service Co.
Sound: RCA.
Ticket Issuing Machine: General Register Corp.

AS CAN BE seen above, the drive-in has been built on a large land area, thus making it possible to have a full-sized playground, large patio and large indoor auditorium. The attractive boxoffice has been constructed of sturdy redwood, with generous use of glass.





BUILT OUT OF brick and redwood, the large building above acts as the concession building, projection booth, and houses the indoor auditorium.

The concession bar has been arranged so that there are different lanes for items ready to buy, and for those items which must be prepared.





THE INDOOR auditorium holds 400 seats and is air-conditioned and centrally heated. The playground is fully equipped with various pieces of motorized and standard rides, and other amusements. It is fenced off and an attendant is always on duty to maintain order.





ABC DRIVE-IN •

Oxon Hill, Md.

Only three miles away from Washington, D. C., this 750 car drive-in draws most of its patronage from a large metropolitan area, and has been operating on a year around basis.

Located on a 12 acre site, this theatre has the space in which to cater to patron desires. The concession building is 45 by 55 feet. The interior has been attractively done in knotty pine creating a clean and cheerful atmosphere. In order to handle the crowds most efficiently, the concession building uses a counter with duplicate equipment on each side so that two lanes may be served at the same time. There is a separate counter to handle the sale of ice cream.

The boxoffice has been constructed of brick pillars in pink, green, red, yellow, and blue all worked together into one lively color scheme. There are two lanes of traffic, with provisions in back of the cashier to sell popcorn, candy, etc.

Instead of installing the usual type of fence around the boxoffice, exits, and entrance, the owners have put in a fence of pine trees.

Included among some of the other features of this outdoor theatre are a small patio and a fully equipped playground. This playground equipment includes 12 swings, a merry-go-round, two slides, and other rides aimed at pleasing the younger set.

REFERENCE DATA

OWNER & OPERATOR: Siccrome Corp.
CAR CAPACITY: 750.
COST OF BUILDING: $200,000.
SIZE OF LOT: 12 acres.

Generators: Hertner Electric Co.
In-Car Speakers: International Projector Corp.
Projection Lamps: National Excelite.
Projection Machines: International Projector Corp.
Rewinders: GoldE Mfg. Co.
Sign Letters: Wagner Sign Service, Inc.
Sound: International Projector Corp.
Supply Dealer: National Theatre Supply.



THE HOLLYWOOD style boxoffice is located behind the screen tower and can handle two lanes of traffic. The pastel colored bricks help to create an inviting atmosphere. The concession building is of an ample size to handle the crowds, and there is a small flamingo colored patio on the side.





THERE IS a well equipped playground in which the youngsters may enjoy themselves. Note the chairs supplied for parents who wish to keep an eye on their offspring. The concession counter has been done in knotty pine and helps create a feeling of cleanliness. A cafeteria style is used.



BRUEN'S SUNDOWN DRIVE-IN •

Whittier, Calif.

This theatre is constructed on a tract covering 14 acres, and can hold up to 1000 automobiles.

The concession building, with counter areas accommodating four complete stations, is done in coral and green. This building also houses the restrooms, and is heated and air-conditioned throughout.

A unique type of construction was used in building the screen tower, which stands seven stories high and is about 110 feet wide. Each of the three pylons supporting the tower weigh 44 tons, and are said to be the highest and heaviest prefabricated reinforced steel concrete steel slabs ever raised. The tower is curved with a radius of 350 feet.

REFERENCE DATA

OWNER & OPERATOR: Bruen's Theatre Co.
ARCHITECT: Balch, Bryan, Perkins & Hutchason.
CAR CAPACITY: 1,000.
COST OF BUILDING: $400,000.
COST OF EQUIPMENT: $45,000.
SIZE OF LOT: 14 acres.

In-Car Speakers: Motiograph, Inc.
Generators: Motiograph, Inc.
Projection Lamps: C. S. Ashcraft Mfg. Co.
Projection Machines: Motiograph, Inc.
Sign Letters: Wagner Sign Service, Inc.
Sound: Motiograph, Inc.
Supply Dealer: B. F. Shearer Co.
Ticket Issuing Machine: General Register Corp.







CLACO DRIVE-IN •

Liberty, Mo.

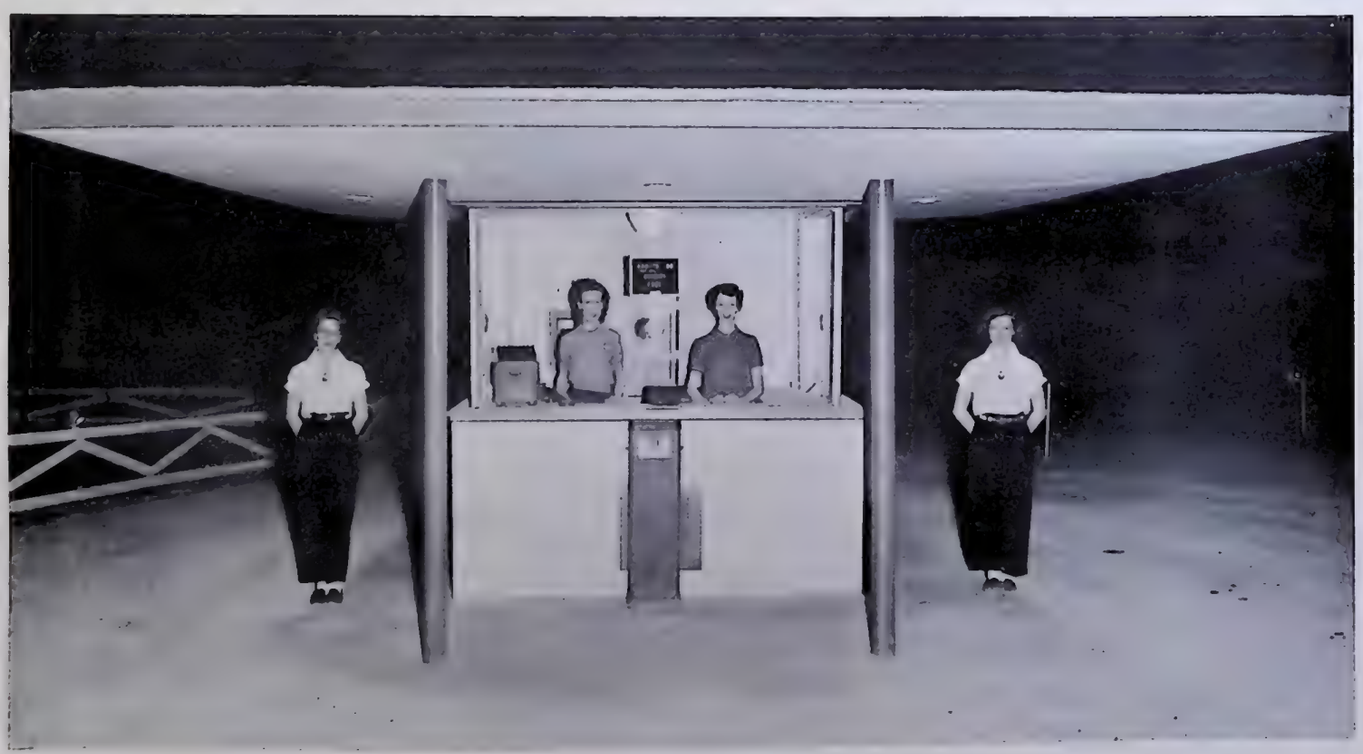
The Claco has been designed as an amphitheatre drive-in which utilizes the natural slope of the terrain. Some 980 cars can be taken care off on the 25 acre site.

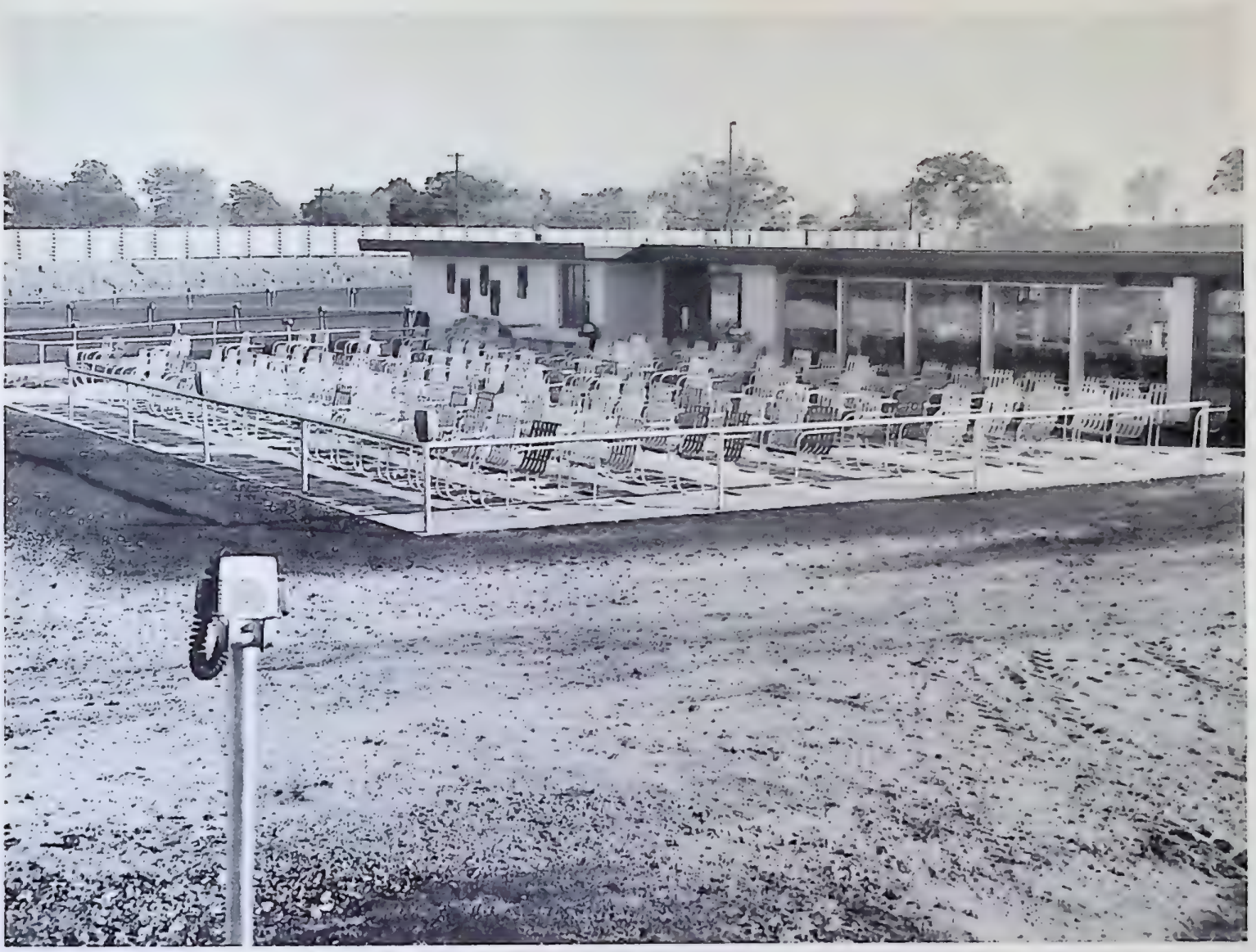
The concession building, the interior of which has been done in yellow and natural driftwood, also houses the projection booth, the restrooms, and the manager's office.

Directly in front of the snack bar is a patio with 250 spring-steel chairs. The snack bar itself is glass-enclosed, and it is possible to both see and hear the picture while making a purchase.

The all-steel and concrete screen tower is capable of showing a picture 96 feet wide and 54 feet high. The playground is located directly in front of the seven story high tower.

A CLOWN figure called Claco has been created and used throughout the drive-in and in advertising and promotional material, as a symbol of the fine entertainment available. The simple, modernistic ticket booth is well lighted and capable of handling the drive-in's 980 car capacity.





A LARGE patio placed directly in front of the snack bar has been provided with 250 comfortable chairs. The snack bar itself is well equipped and colorfully finished in yellow and natural driftwood. The generous use of glass makes it possible to see the picture while making your purchase.

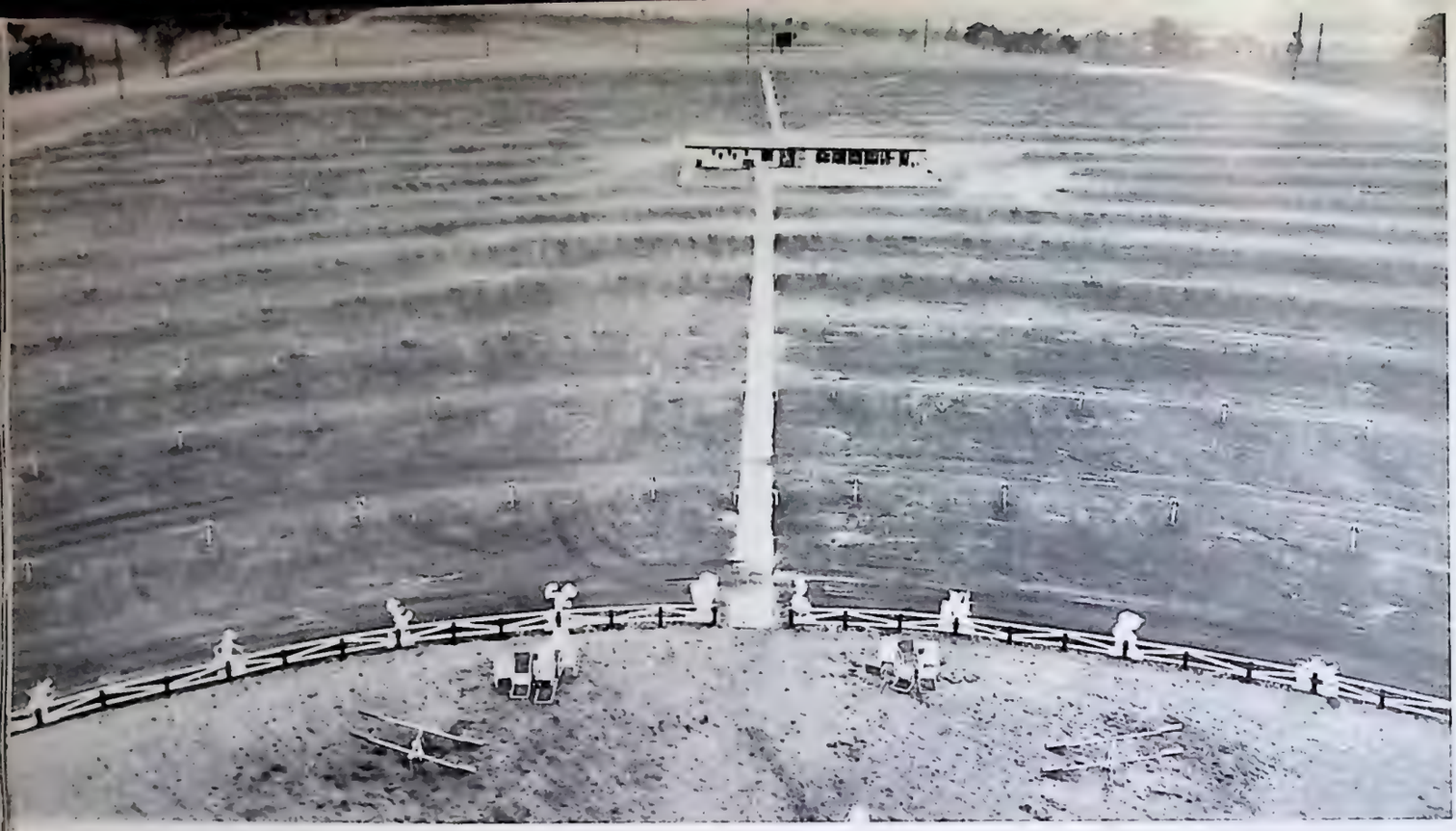
REFERENCE DATA

OWNER: Clay County Theatre Corp.
OPERATOR: Consolidated Agencies.
CAR CAPACITY: 980.
SIZE OF LOT: 25 acres.

In-Car Speakers: RCA.
Lenses: Kollmorgen Optical Corp.
Projection Lamps: Strong Electric Corp.
Projection Machines: RCA.
Rectifiers: Strong Electric Corp.
Sign Letters: DIT-MCO.
Sound: RCA.
Supply Dealer: Missouri Theatre Supply.







THE CLACO is located on a 25-acre tract of land and is a natural amphitheatre. The tower is seven stories high and can show a 96-foot wide picture. A well equipped playground is located in front of the tower. Seats and speakers are provided for parents who wish to watch the kids at play.



WADSWORTH INDOOR DRIVE-IN •

Denver, Colo.

As its name implies, this is an indoor drive-in theatre with facilities for 1000 automobiles, and a glass enclosed, air-conditioned theatre with a seating capacity for over 500 persons.

Representing an investment of close to $400,000, nothing has been spared in an effort to make this a first-class deluxe outdoor venture.

The incoming cars are formed into six lanes and quickly taken care of by the three boxoffices. To avoid traffic congestion the exits have been built in the rear.

The theatre building houses the auditorium, projection booth, manager's three bedroom penthouse apartment, lounges, a cafeteria style snack bar, storage space, and a power plant.

The huge seamless tower can show a CinemaScope picture 96 feet wide.

REFERENCE DATA

OWNER: Lee Theatres, Inc.
OPERATOR: L. K. Lee.
ARCHITECT: Paul Rush.
CAR CAPACITY: 850, 500 seats.
COST OF BUILDING & EQUIPMENT: $385,000.
SIZE OF LOT: 13½ acres.

Generators: Hertner Electric Corp.
In-Car Speakers: International Projector Corp.
Projection Lamps: National Excelite.
Projection Machines: International Projector Corp., Simplex X-L.
Sound: International Projector Corp.
Supply Dealer: National Theatre Supply.
Ticket Issuing Machine: General Register Corp.





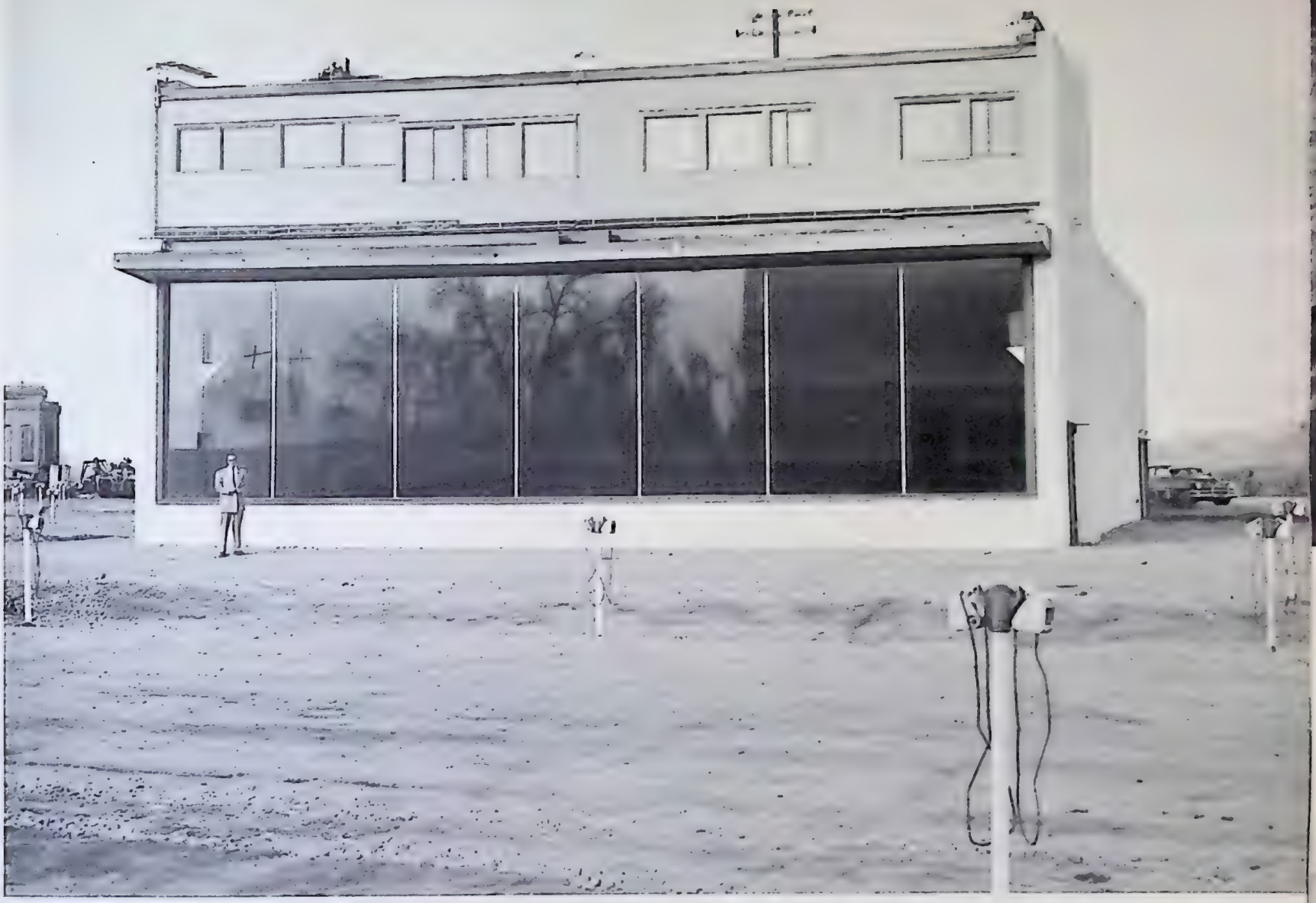




THE 103-foot screen tower, seen above, has been coated with concrete, sprayed on, in order to achieve a six-story seamless screen.

THE WELL stocked snack bar can handle four lanes of patrons. The equipment is able to handle anything from hot dogs to full meals.





THE MAIN building is 145 feet long and houses the indoor theatre, the projection booth, the snack bar, lounges and restrooms. There is also a full-sized five-room apartment for the manager.

THE AUDITORIUM seats 502 persons, and is completely heated and air-conditioned. Two high fidelity speakers in each corner furnish the sound. The theatre has three seating sections.

THE GLASS front is in seven strips eight feet by 13½ feet, and is vertical. The seating is so arranged that the screen is always above eye level, and the view is always excellent.







NORTH ANDREWS DRIVE-IN •

Ft. Lauderdale, Fla.

Here is a fine example of a well designed and smoothly operated medium-sized drive-in, having a 478 car capacity.

Since the theatre is located in sunny Florida, the decorating wisely takes advantage of the weather. The tropical landscaping features Australian pine hedges in the back area, with an hibiscus hedge on the main road area. There are palm trees on one side of the entrance and the marquee sign on the other.

The ticket office and main building are of coral pink concrete, trimmed with brick.

The screen tower is 45 by 90 feet and the projection booth is fully equipped for CinemaScope. The two-speaker type of stereophonic sound is used.





REFERENCE DATA

OWNER & OPERATOR: Wometco Theatres.
ARCHITECT: A. Herbert Mathes.
CAR CAPACITY: 478.
SIZE OF LOT: 8-10 acres.

Display Frames: Universal Corp.
In-Car Speakers: RCA.
Lenses: Kollmorgen Optical Corp.
Projection Lamps: C. S. Ashcraft Mfg.
Projection Machines: RCA.
Sign Letters: Adler Silhouette Letter Co.
Sound: RCA.
Stadium Chairs: Ideal Seating Co.
Supply Dealer: Southeastern Theatre Equip. Co.; Joe Hornstein, Inc.; United Theatre Supply.
Traffic Counter: K-Hill Signal Co., Inc.





MOTOR VU DRIVE-IN •

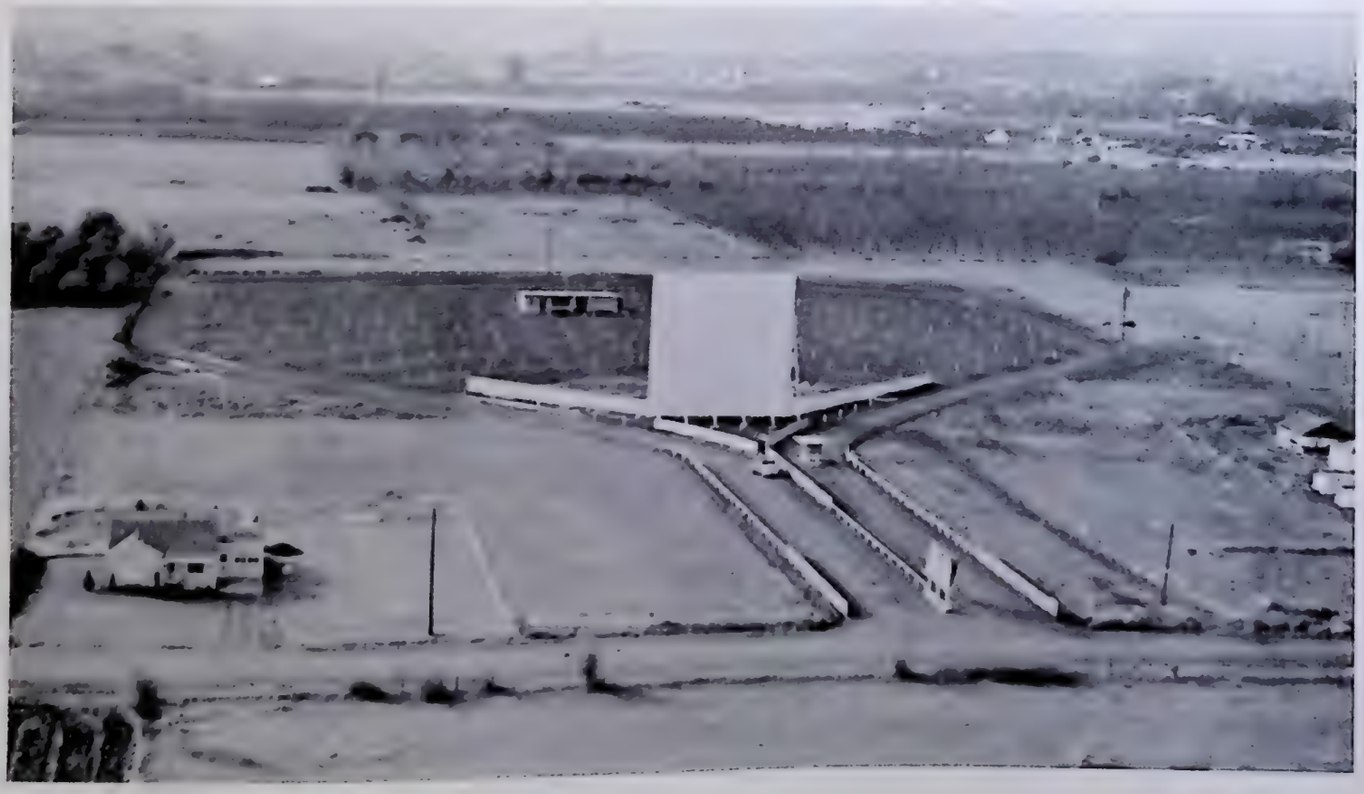
Dallas, Ore.

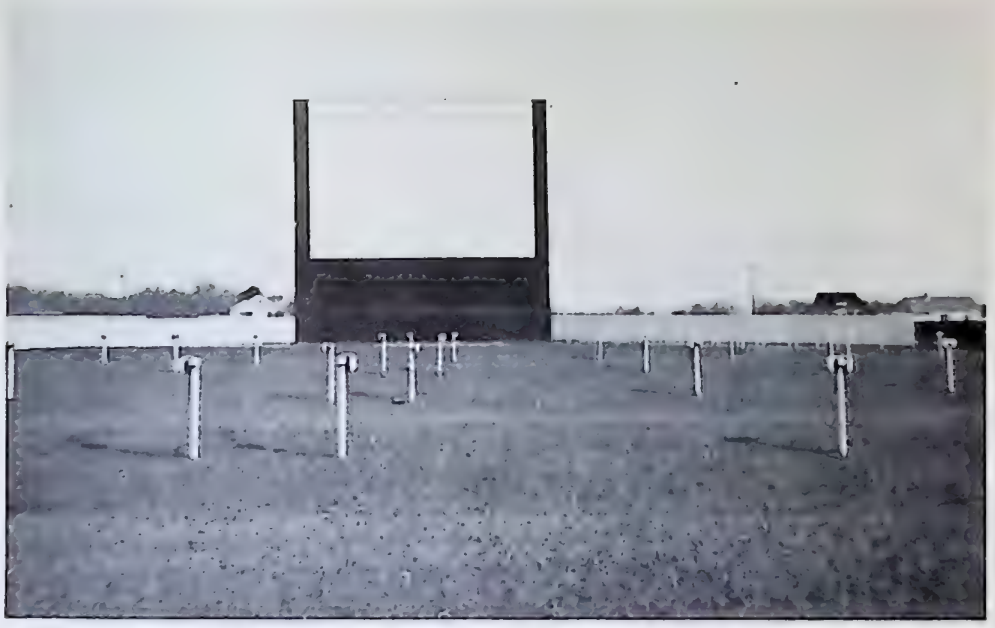
This outdoor theatre is built on a 13 acre tract and has 10 ramps. However, only eight are used, with the other two acting as a holding area for 110 cars. The used ramps will hold 400 cars.

The main building holds the office, storeroom and the snack bar. The concession area makes use of the cafeteria style of service. The counter has a brushed cedar front and a formica top.

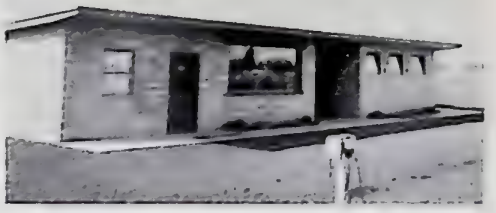
A 60 by 60 foot screen tower has been erected, but with provisions for it to be expanded at any time. The tower is of an all-steel construction, with 12 concrete slabs for support.

The ticket booth can handle two lanes of cars, and it is equipped with a wireless intercom outfit so that the cashier can be in constant touch with the office and the projection booth.









THIS DRIVE-IN has 200 speaker posts, but has two ramps available for future expansion. The screen tower has also been constructed so that it can be converted for wide screen films at any time. The office, storage rooms, and the snack bar are conveniently located in one place.

REFERENCE DATA

OWNER & OPERATOR: Creck Corp.
CAR CAPACITY: 400.
COST OF EQUIPMENT: $18,000.
SIZE OF LOT: 12¾ acres.

In-Car Speakers: RCA.
Lenses: Kollmorgen Optical Corp.
Projection Lamps: C. S. Ashcraft Mfg. Co.
Projection Machines: RCA.
Rewinders: Goldberg Bros.
Sound: RCA.
Supply Dealer: Modern Theatre Supply.





BROKEN BOW DRIVE-IN •

Broken Bow, Nebr.

Located high on a hill, this drive-in requires a one-half mile driveway, and no light barrier fences are necessary because of the height. The striking view is one of the drive-in's "extras."

Built at a cost in excess of $100,000, this ozoner has a 448 car capacity. The concession building is 60 by 32 feet. The walls are Philippine mahogany, and there is a 58 foot curved snack bar. Acoustical celotex has been used in the ceiling, and there is recessed lighting.

The screen tower is 60 by 56 feet, and constructed of cement block painted white.

White cement block and glass block has been used to build the boxoffice, with colored lighting used behind the glass brick.

THE DRIVE-IN's name is depicted by the illuminated sign. The boxoffice is built of cement and glass blocks, and can handle two traffic lanes.





THE CONCESSION area has a 58 foot curved snack bar and is well equipped. The playground has a multi-colored fence and a candy cane gate.

REFERENCE DATA

OWNER & OPERATOR: C. Howard Kennedy.
CAR CAPACITY: 448.
COST OF BUILDING: $71,214.
COST OF EQUIPMENT: $32,871.

SIZE OF LOT: 40 acres.

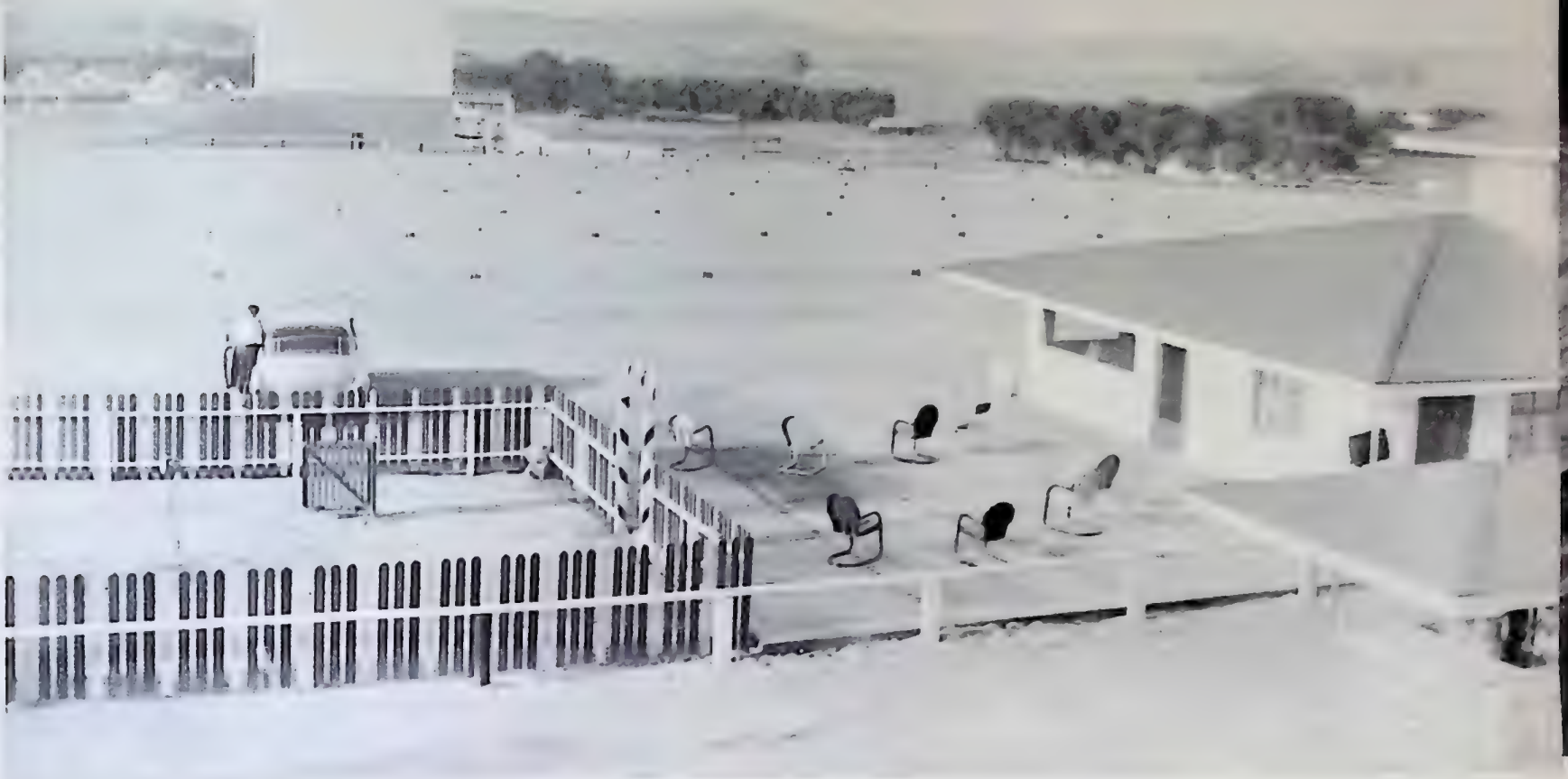
Film Cabinets: Goldberg Bros.
In-Car Speakers: RCA.
Lenses: Kollmorgen Optical Corp.
Projection Lamps: C. S. Ashcraft Mfg.
Projection Machines: RCA.
Rectifiers: C. S. Ashcraft Mfg. Co.
Rewinders: Goldberg Bros.
Sound: RCA.
Supply Dealer: Western Theatre Supply.
Vending Machines: Manley, Inc.



THE LADIES' LOUNGE is furnished with a black make-up table containing planters. Two white leather davenports are used with black corner table.

THE CONCESSION building is built of white cement block with a red asbestos shingled roof. Projection booth is located on the second story.





THE PLAYGROUND and the concession building are connected by a small patio which has chairs available for those patrons who wish to see the program out of their cars. Seen below is a night view of the drive-in. Located on top of a hill, there is an impressive view of the rolling hills.





WESTBURY DRIVE-IN • Westbury, L. I., N. Y.

Representing an investment of $600,000, the Westbury is considered to be one of the largest outdoor theatres in the world. This theatre has facilities for 2000 cars on its 28 acre tract.

The tremendous screen tower is 100 feet high and 130 feet in length, and can be seen within a one-half mile radius. Standard films are shown as a 93 by 56 foot picture, and CinemaScope films over an area covering 124 feet wide by 56 feet high.

Included among the many services offered by the Westbury are a $135,000 concession building with a snack bar featuring all stainless steel equipment; direct concession-to-car refreshment service; a large outdoor terrace for dining purposes; and a fully equipped playground to accommodate 500 children.



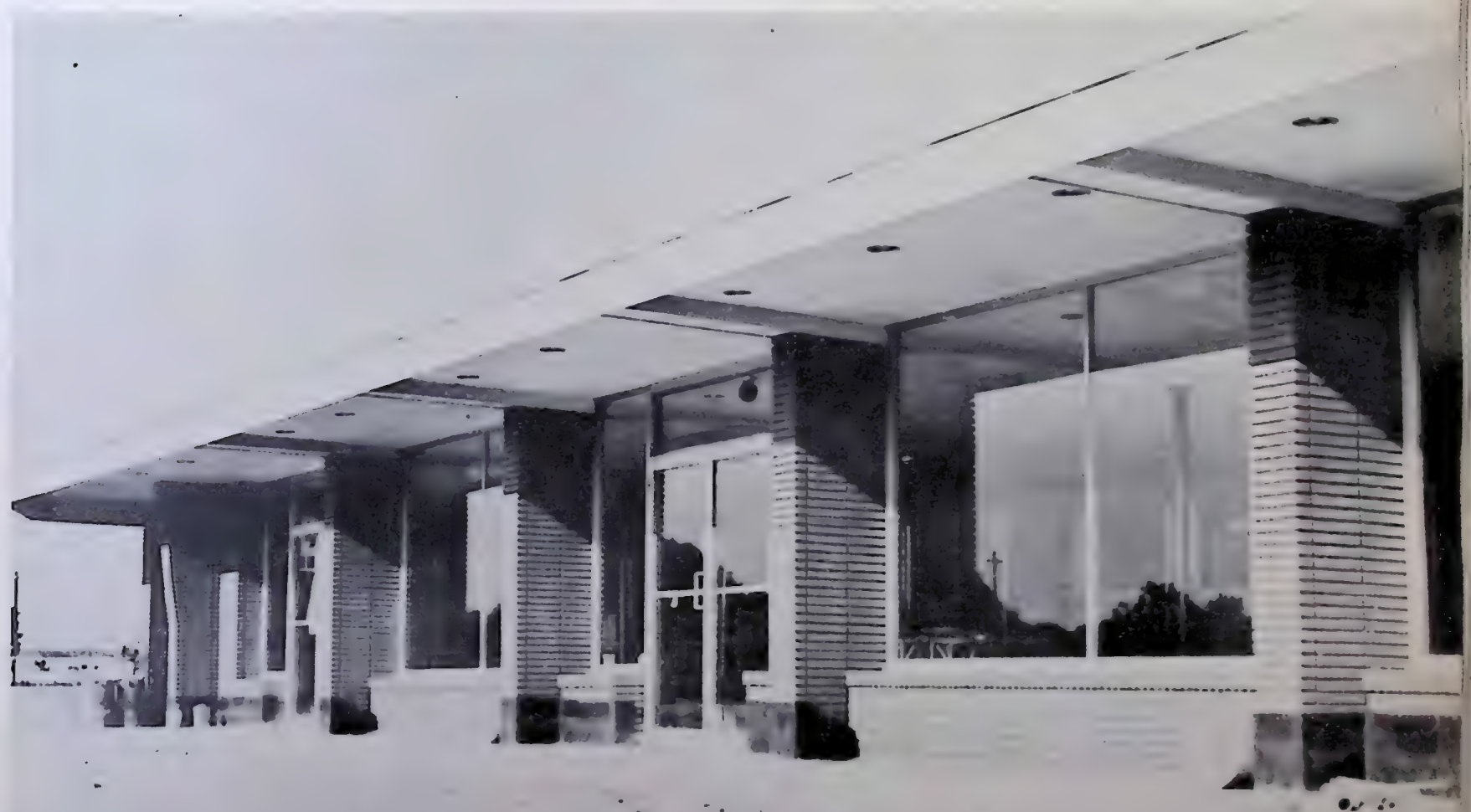


REFERENCE DATA

OWNER: Drive-In Westbury Corp.
OPERATOR: Saul Lerner.
ARCHITECT: Lloyd Monroe.
CAR CAPACITY: 2,000.
COST OF BUILDING & EQUIPMENT: $600,000.
SIZE OF LOT: 28 acres.

In-Car Speakers: RCA.
Playground Equipment: Miracle Whirl Sales Co.
Projection Lamps: RCA.
Projection Machines: RCA.
Rewinders: Goldberg Bros.
Sign Letters: Adler Silhouette Co.
Sound: RCA.
Supply Dealer: Capitol Motion Picture Supply.

THE GIANT screen (above) is 100 feet high, and 130 feet in length, making it one of the world's largest outdoor screens. The concession building (below) contains the equipment to handle 2000 car capacity of the theatre. The entire project cost well over one-half million dollars to construct.





FAMILY DRI-VIN •

Tigard, Ore.

Constructed in a stadium type field with back rows several feet higher than the front rows, this drive-in parks 700 cars in a single ramp system.

The boxoffice has been located at the bottom of the driveway in order to line up over 100 cars without forcing them into the highway.

There is a one story building in which is housed the concession area and the projection booth on the same level. The cafeteria style of service is used, with the kitchen behind the bar.

The concession building is equipped with speakers and surrounded by windows so that patrons may still enjoy the show while making their purchases.

REFERENCE DATA

OWNER & OPERATOR: Jesse Jones Theatres.

CAR CAPACITY: 700.

Generators: Hertner Electric Corp.
Lenses: Bausch & Lomb Optical Co.
Projection Lamps: Strong Electric Corp.
Projection Machines: Century Projector Corp.
Sound: Century Projector Corp.





THE FAMILY Dri-Vin can handle 700 cars, using the single ramp system. A snack bar is located in the center of the field with the back ramps looking over the building. The tower is on the west end of the field and made of wood. The snack bar has cafeteria style service with the kitchen and storage space directly behind the bar. This area has many windows and a loudspeaker has been placed inside in order to see and hear the program.



SIDNEY LUST'S HILLSIDE DRIVE-IN •

Hillside, Md.

Serving the heavily populated Washington, D. C., area this drive-in theatre attracts immediate attention with its screen tower design. Directly under the large letters spelling out the name of the theatre there are two large traditional theatre masks, one representing laughter and the other sadness.

The Hillside, which cost approximately $265,000 to construct, has a 715 car capacity. There are also accommodations for 200 walk-in customers.

The screen tower is built of steel beams and has a masonite covering. A large outdoor stage, complete with stage lighting equipment has been built directly in front of the tower. The space under the stage houses dressing rooms.



THE ENTRANCE to this drive-in is dominated by the patron-attracting screen tower decoration. A traffic light, which is controlled by the management, helps to control the traffic effectively.





THE HILLSIDE, with a 715 car capacity, draws most of its patronage from the heavily populated Washington, D. C. area. A large concession building is located in the center of the drive-in field.

REFERENCE DATA

OWNER: Sidney B. Lust.
OPERATOR: Sidney B. Lust Theatres.
ARCHITECT: Ted Rogvoy.
CAR CAPACITY: 715.
COST OF BUILDING: $265,000.
COST OF EQUIPMENT: $55,000.
SIZE OF LOT: 10 acres.

Generators: RCA.
In-Car Speakers: RCA.
Lenses: Kollmorgen Optical Corp.
Projection Lamps: C. S. Ashcraft Mfg.
Projection Machines: RCA.
Rewinders: GoldE Mfg. Co.
Sign Letters: Wagner Sign Service, Inc.
Sound: RCA.
Supply Dealer: Elmer H. Brient & Sons, Ben Lust Theatre Supply.
Ticket Issuing Machine: General Register Corp.







STARLITE DRIVE-IN •

Lansing, Mich.

The Starlite is a good example of how careful planning and a knowledge of the field can result in the building of a drive-in theatre that furnishes all necessary services and still costs a reasonable figure.

With 600 speaker positions, this outdoor theatre cost a little less than $100,000 to construct, including the cost of the 17 acres of land.

The screen tower is 60 by 60 feet, and has a transite screen face with an embossed aluminum exterior. The frame has been made of wood. Directly in front of the tower is a playground which has been equipped with all of the basic apparatus necessary to keep the youngsters happy and busy.

The main building has been constructed of cinder block and holds the snack bar and the projection booth.

REFERENCE DATA

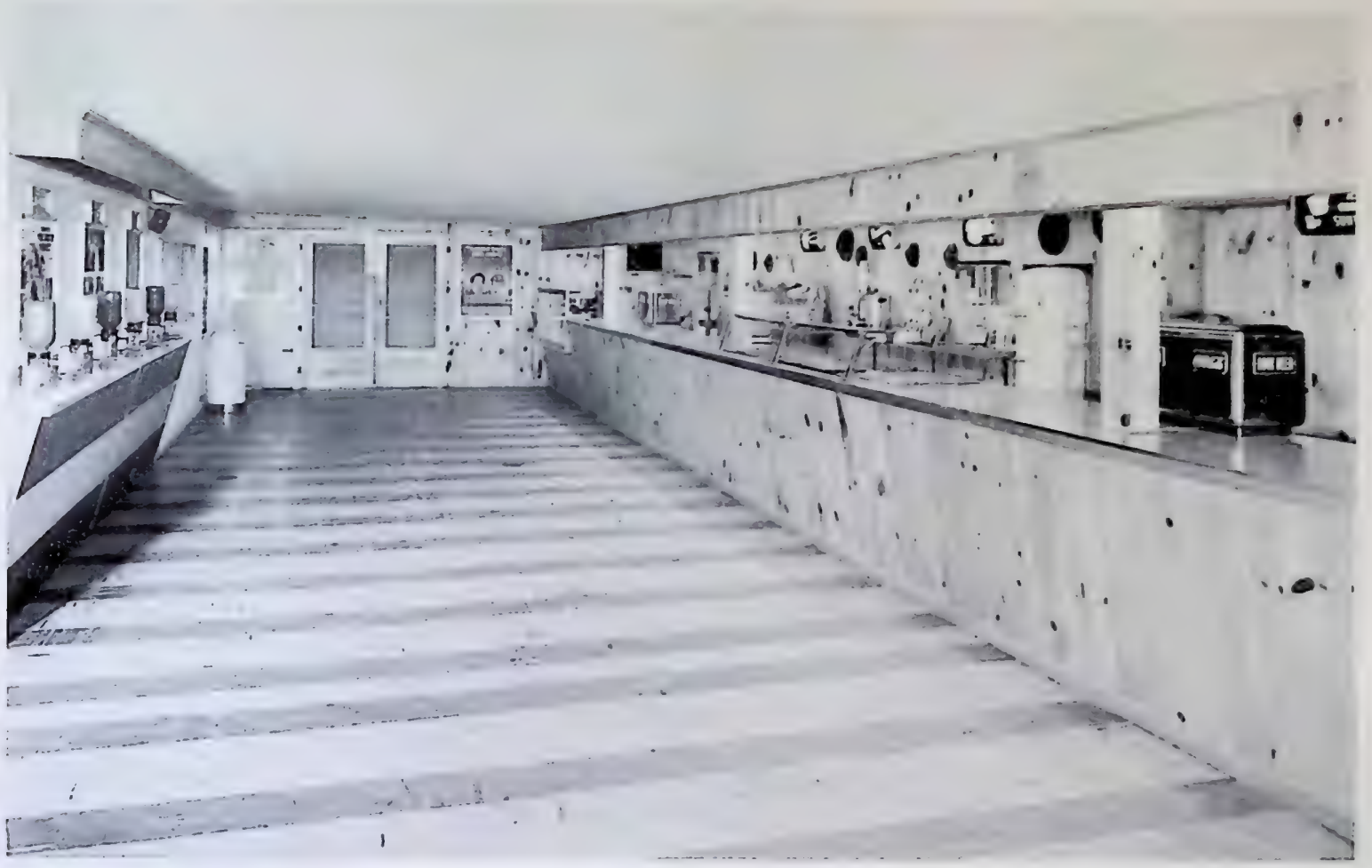
OWNER & OPERATOR: J. W. Blackburn.
CAR CAPACITY: 600.
COST OF BUILDING: $65,000.
COST OF EQUIPMENT: $20,000.
SIZE OF LOT: 17 acres.

Generators: Motiograph, Inc.
In-Car Speakers: Motiograph, Inc.
Lenses: Kollmorgen Optical Corp.
Projection Lamps: Strong Electric Corp.
Projection Machines: Motiograph, Inc.
Sign Letters: Wagner Sign Service, Inc.
Sound: Motiograph, Inc.
Supply Dealer: Ringold Theatre Supply.
Ticket Issuing Machine: General Register Corp.



THE STARLITE has a car capacity of 600. The ticket booth can handle two lanes of traffic. A small patio has been provided for patron use.



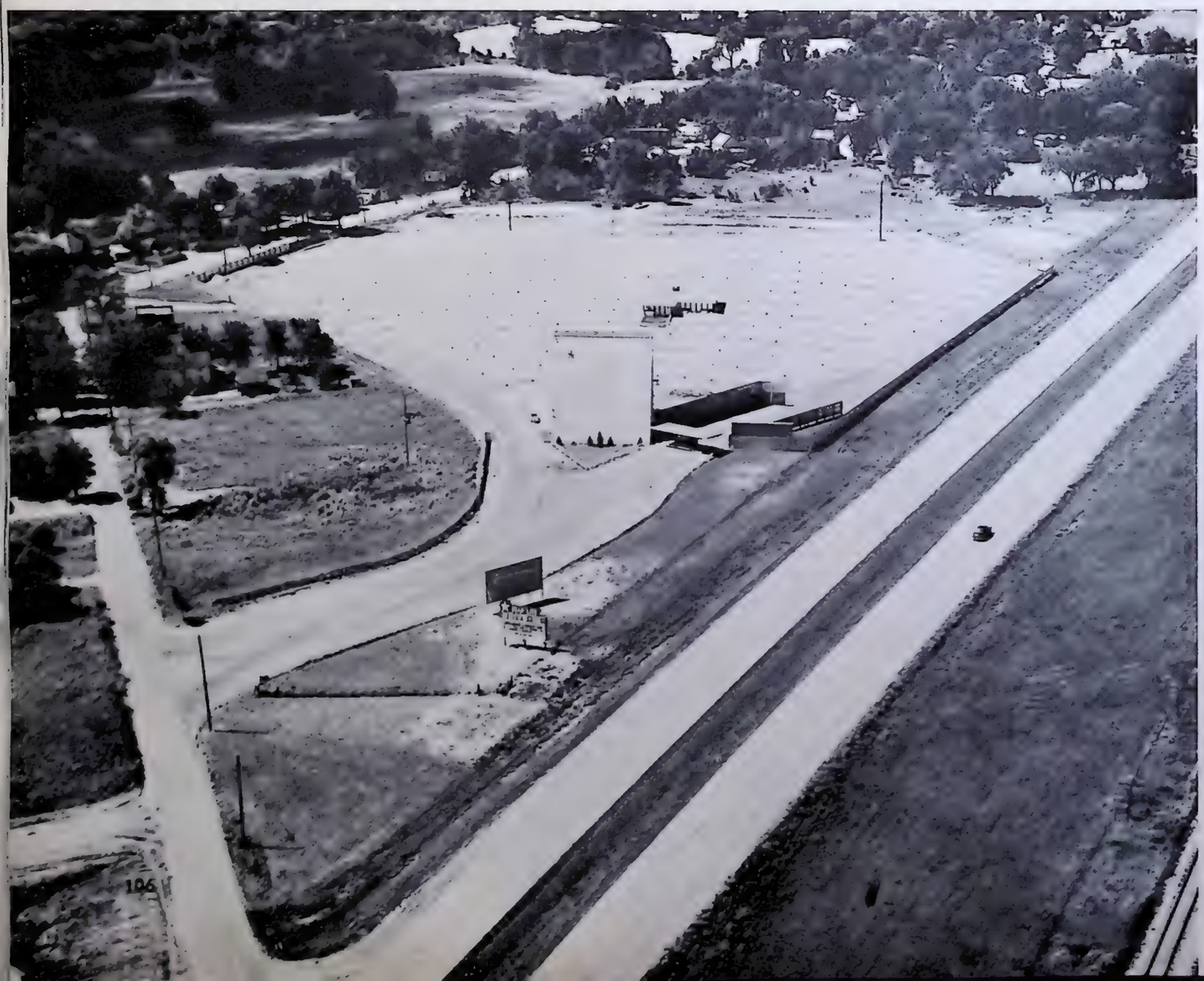


THE CONCESSION area is attractively decorated with the snack bar finished in knotty pine. The counter type of service is employed at this theatre.

THE SCREEN tower is made of wood and the screen surface has been faced with transite. A small, but complete playground is in front of the tower.



SPREAD over a generous 17 acre lot, this drive-in is located directly off a main highway, and only two miles out of Lansing, Mich. The theatre draws its patronage from an area of approximately 100,000 people. Although the project cost less than $100,000 to construct, it is a first-class operation.





REDA DRIVE-IN •

London, Ky.

With many of the features designed by the operator of this theatre, the Reda is a neatly laid out and attractive 400 car drive-in.

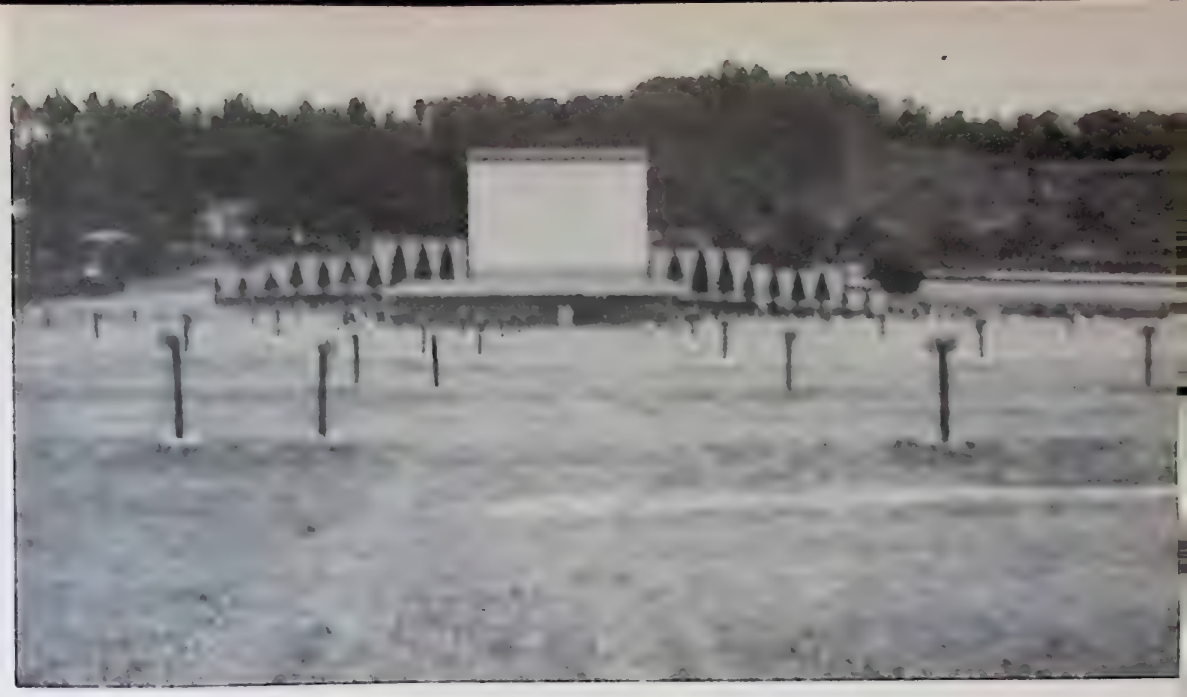
The boxoffice has been angled so that two cars at a time may be accommodated. A set of twins, who are alternated each night, handle the tickets and provide a pleasant guessing game for the customers.

The fence has been painted to look like green pine trees. The concession area has been attractively designed.

REFERENCE DATA

OWNER: Don, Mose, Ernie Reda.
OPERATOR: Charles Grant.
CAR CAPACITY: 400.
COST OF EQUIPMENT: $26,000.
SIZE OF LOT: 10 acres.

Film Cabinets: Goldberg Bros.
Generators & Rectifiers: RCA.
In-Car Speakers: RCA.
Lenses: Kollmorgen Optical Corp.
Projection Lamps: RCA.
Projection Machines: RCA.
Sound: RCA.











CENTENNIAL DRIVE-IN •

Littleton, Colo.

Situated off a main highway south of Denver, the Centennial represents an investment of almost one-half million dollars, with facilities for a maximum of 1,050 cars.

A twin screen drive-in, this theatre is equipped for CinemaScope and full stereophonic sound, using two speakers for each car.

The concession building is of cinder block construction and has a dark green exterior with yellow trim. The interior is done in red coral with grey plastic tile floors.

REFERENCE DATA

OWNER & OPERATOR: Television Theatres, Inc.
ARCHITECT: Tom Griffing.
CAR CAPACITY: 1,050.
COST OF BUILDING: $300,000.
COST OF EQUIPMENT: $150,000.

Generators: Hertner Electric Co.
Lenses: Kollmorgen Optical Corp., Bausch & Lomb Optical Co.
Projection Lamps: International Projector Corp.
Projection Machines: International Projector Corp.
Rewinders: Goldberg Bros.
Sign Letters: Theatre Specialties, Inc.
Sound: International Projector Corp.
Supply Dealer: National Theatre Supply.
Ticket Issuing Machine: General Register Corp.
Ticket Chopper: General Register Corp.

THE MARQUEE is green set off by red neon. The base is stone and has flower boxes built into the bottom. Traditional masks have been placed in the marquee base for pleasing effect.





THE SNACK BAR has grey plastic tile floors, and the walls are a bright shade of coral red. The area is well lighted by recessed fixtures. The counter is equipped to handle the crowds.

SPREAD over a one-quarter mile square of land, this drive-in has two large CinemaScope screens. The projection throw to each tower is 540 ft. Screens are faced with asbestos material.

THE CENTENNIAL is one of the few outdoor theatres to be equipped for full stereophonic sound. The system employed requires the use of a speaker on the left and on the right side.





DRUID HILL DRIVE-IN •

Maryville, Tenn.

One of the better new drive-in theatres to be constructed in the South, is the Druid Hill. Drawing the bulk of its patronage from a heavily populated residential area, the theatre operates on a first-run film policy.

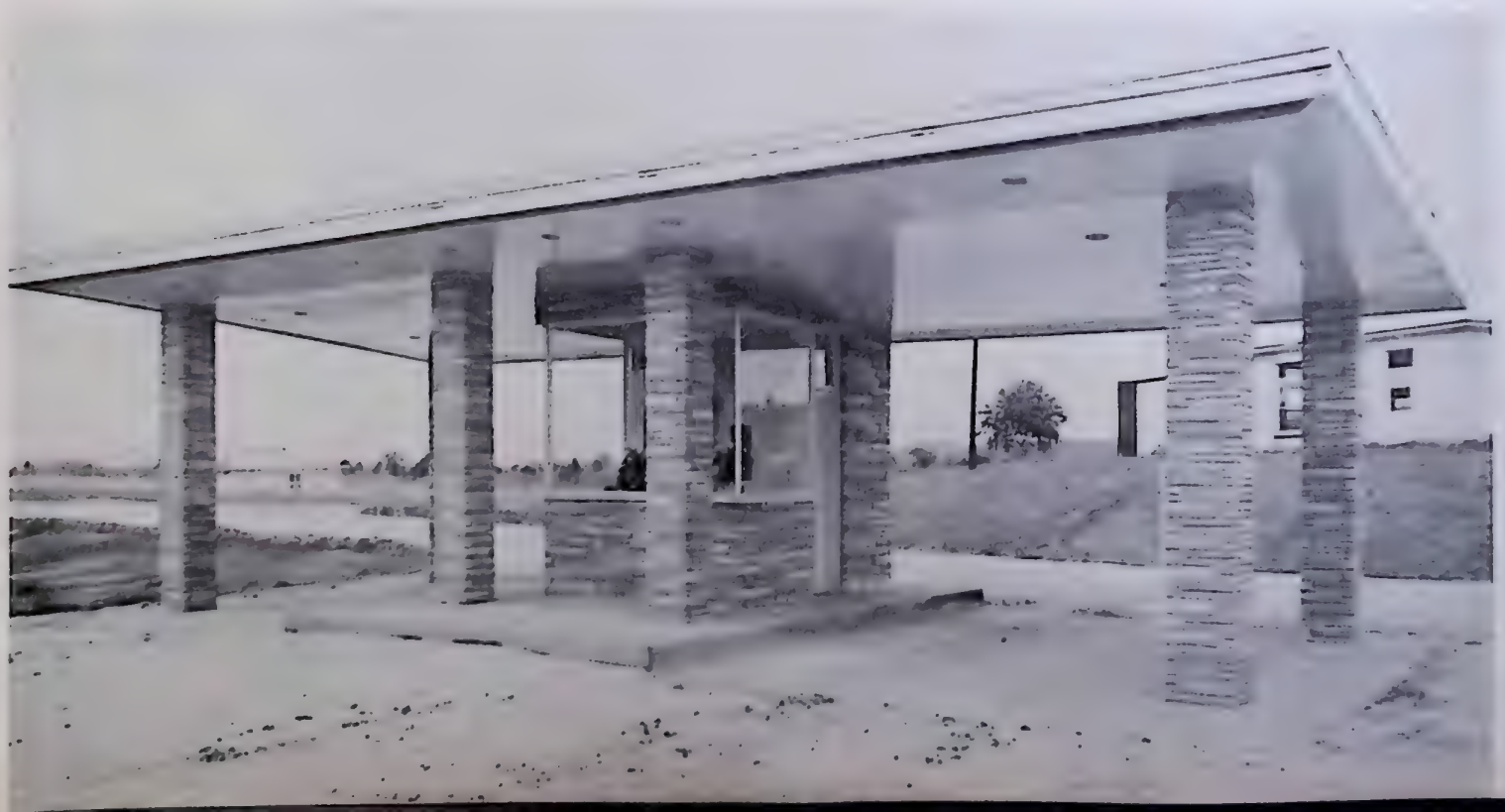
The parking area, which is part of the 16 acres on which the theatre is located, has facilities for 700 cars.

The ticket office is made of brick pillars, with a generous use of glass. The design is simple and modern in appearance, with recessed fixtures furnishing the necessary illumination for the two lanes of traffic.

The concession building uses a cafeteria type of service and can handle two lanes of customers. The snack bar is attractively finished in knotty pine, and the counters have Formica tops, which are attractive and easy to keep clean.

The projection booth is located on top of the concession building.

Located in the rear of the concession building is a playground area which is fenced off.



REFERENCE DATA

ARCHITECT: Fred Bearden.
CAR CAPACITY: 700.
SIZE OF LOT: 16 acres.

Generators: RCA.
In-Car Speakers: RCA.
Lenses: Kollmorgen Optical Corp.
Projection Lamps: RCA.

Projection Machines: RCA.
Sound: RCA.
Supply Dealer: Southeastern Theatre Equip. Co.

THE CONCESSION snack bar at the Druid Hill is attractively finished in knotty pine, creating a fresh, clean atmosphere. The projection booth is located directly on top of the concession building. Located in back of this area is the playground. When filled, the theatre holds 700 cars.







SUNDOWN DRIVE-IN •
Mandan, N. D.

One of the most interesting features of this 700 car outdoor theatre is the fact that it has a long projection throw of 525 feet, with a narrow projection angle of only 70 degrees. A 60 by 40 foot picture is shown on the all-steel screen tower.

The main building is made of cinder blocks and houses the snack bar, with the projection booth also located on the roof.

The snack bar has been so arranged and equipped so that it can accommodate patrons at two complete service counters. The interior has been done in white with red trim for contrast.

REFERENCE DATA

OWNER: Sundown Theatres, Inc.
OPERATOR: A. D. Wetzstein.
ARCHITECT: Associated Design, Inc.
CAR CAPACITY: 700.
COST OF BUILDING: $35,000.
COST OF EQUIPMENT: $25,000.
SIZE OF LOT: 20 acres.

In-Car Speakers: International Projector Corp.
Lenses: Kollmorgen Optical Corp.
Projection Lamps: National Excelite.
Projection Machines: International Projector Corp.
Rectifiers: J. E. Robin, Inc.
Rewinders: Goldberg Bros.
Sign Letters: Theatre Specialties, Inc.
Sound: International Projector Corp.
Supply Dealer: National Theatre Supply.



DRIVE-IN THEATRES

1954-55

Panama's First Drive-In

Step-By-Step Study of the Planning and Construction of the First Drive-In Theatre to Be Built in Panama

By J. L. PUTATURO
Vice-president, Cia. Panamena De Diversiones, S. A.

BRIEF: ***It has not been too long since the drive-in was a mere novelty in this country . . . and not taken very seriously . . . However . . . this form of exhibition has grown until it is a vital part of the entire motion picture industry . . . This article offers a complete history of the construction of the first outdoor theatre to be built in Panama . . . and which represented the first outdoor theatre to be constructed in Latin America.***

The author offers interesting insight into the many problems that are involved in constructing a drive-in . . . and there are many valuable lessons to be learned by anyone who is thinking of building an outdoor theatre . . . A particularly interesting section is the one in which the author gives a day-by-day account of the experiments undertaken to equip the theatre properly for the showing of three-dimensional films . . . and how they prepared themselves for the installation of a wide screen.

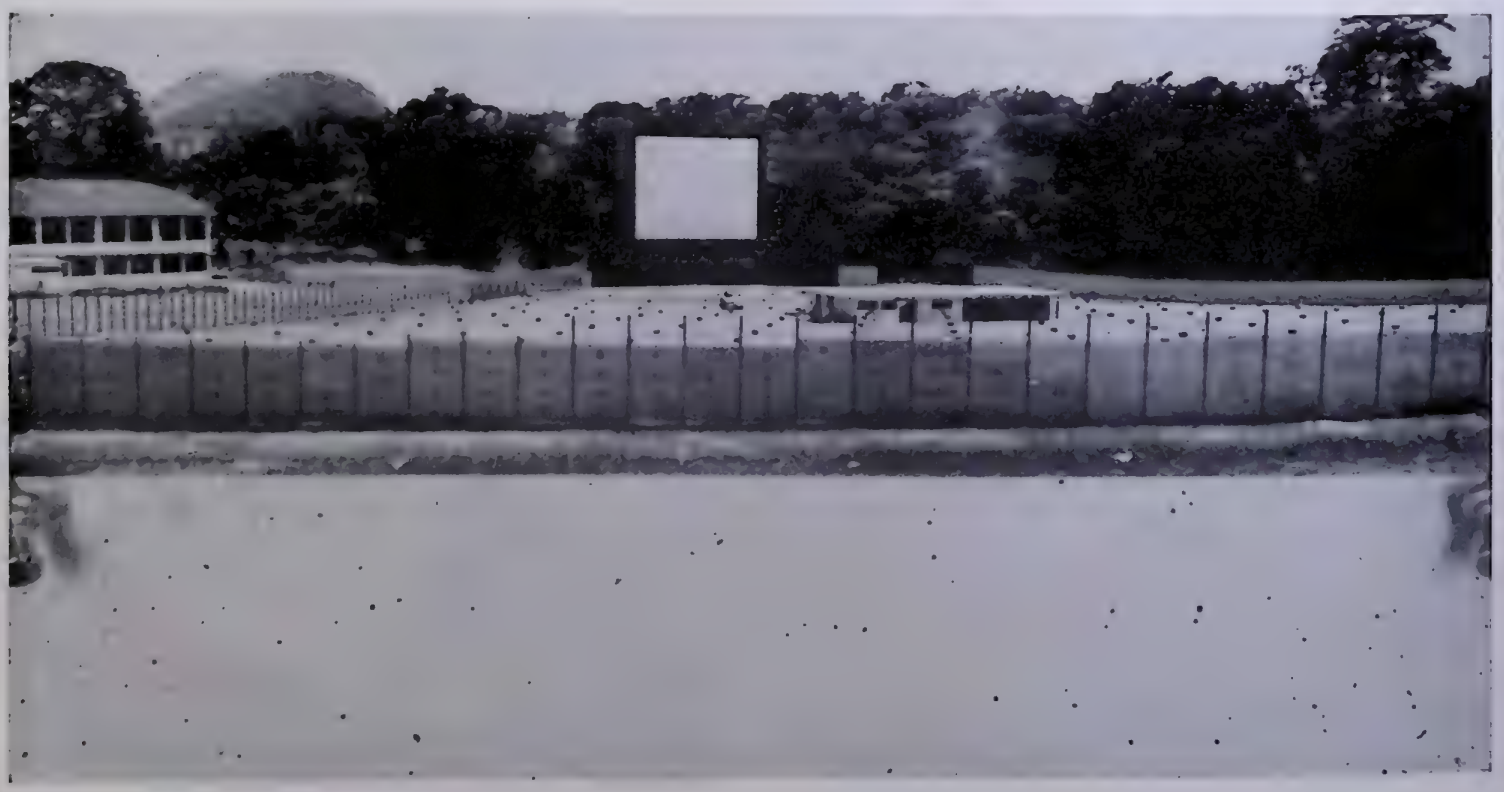
Several weeks prior to its opening date, the local newspapers began to announce the premier opening of Panama's first drive-in theatre, with a capacity of 636 cars. This was the first drive-in theatre to be built in Latin America.

The above announcement was made possible by Compania Panamena de Diversiones, S. A., a company made up of prominent Panamanian and United States business men. In order to finance this new venture this company was formed.

While touring the United States, by auto, Elton Todd noticed the amazing number of drive-ins under construction and almost as many new ones in operation. After thinking the matter over for two months, he decided it was a good idea for Panama. He immediately contracted the source of most of the drive-in theatres in Texas, Ezell and Associates. Making a special trip to Dallas in quest of information, he was most heartily welcomed and encouraged by C. C. Ezell and his entire organization. On his return to Panama, he immediately contacted a friend in the construction business, and they agreed between themselves to form a partnership. Only after much careful study and research had been in progress for almost two years, did the two partners decide that the venture was a sound financial investment, and give the project the green light.

Site Location

After surveying almost every plot of available land in Panama large enough to house the size of the theatre wanted, they finally located in what could be considered the center of town. Panama is built with all of the commercial section on one end of town and the residential section on the other. The Autocine is located directly between these two, and directly across from the recently completed University of Panama. It was considered very fortunate to obtain this site in view of the following facts: (1) It is very difficult to find 40,000 square meters of property centrally located which has not been sub-divided, and the price of land runs from $6.00 to $35.00 per square meter. (2) Drainage was the main problem since the annual rainfall, occurring for six months or more out of the year, from June through November, is 69 inches average. Fortunately, this same plot of land had an existing double 4 by 4 foot box storm drain, running through the full length of the property. (3) Also, the property was complete with sanitary sewers and man holes, which are maintained by the United States Government. It also had the advantage of nature's drainage to drain on both sides of the center line of the theatre and a 12 foot drop from the rear of the property, being the rear of the theatre, toward the screen tower into a main drainage artery (Curundu River). Panama City has had as high as five inches of rain in three hours, so it can easily be seen that this water has to go somewhere after falling on 40,000 sq. meters of parking lot. Five minutes after a rain the theatre has not one trace of rain



PANAMA'S only drive-in has a capacity of 636 cars, and has been designed and operated in a manner similar to top outdoor theatres in U.S.A.



THE SPEAKER junction box has down light that illuminates the post. It also has a built-in concession light for service in parked autos.

water anywhere on it. This is a real accomplishment in regards to drainage and has to be seen to be appreciated. (4) The accessibility of the theatre is well-nigh perfect, being just two blocks from the main thoroughfare. There is a two lane, concrete loop road passing the entrance and exit of the theatre. This street was made one-way for the convenience of traffic to and from the theatre. This same street also affords the theatre a 200-car holding area off the main highway.

The owners of the largest chain of drive-in theatres in the southern part of the United States, Ezell and Associates of Dallas, Texas, provided the facilities for technical research activities. The Texas firm also provided the original layout plans, by Albert Lopez, based on actual field surveys, which were taken by Rosendo B. Jurado, a prominent engineer in Panama, who also converted the final plans into the metric system. (Metric system required by law to obtain the building permits and all necessary local regulations and approvals).

At last, construction was begun by the author, using the company's own forces.

Since the general layout was designed for the acquired property, dirt moving was not much of a problem. We had exactly 20,000 cubic yards of cut embankment and 20,000 cubic yards of fill. The dirt was handled by two Super C-Tournapulls and one D7 Caterpillar Bulldozer. The bulk of the earth work was completed in two weeks. The builder wanted a certain amount of moisture to compact the fills, however (in order that the reader may understand our wet season in Panama) 3,000 cubic yards of fill on one of the slopes was washed away during the course of a one-hour shower. Steps had to be taken immediately to sod the slopes at the same time they were being constructed. This method solved the problem.

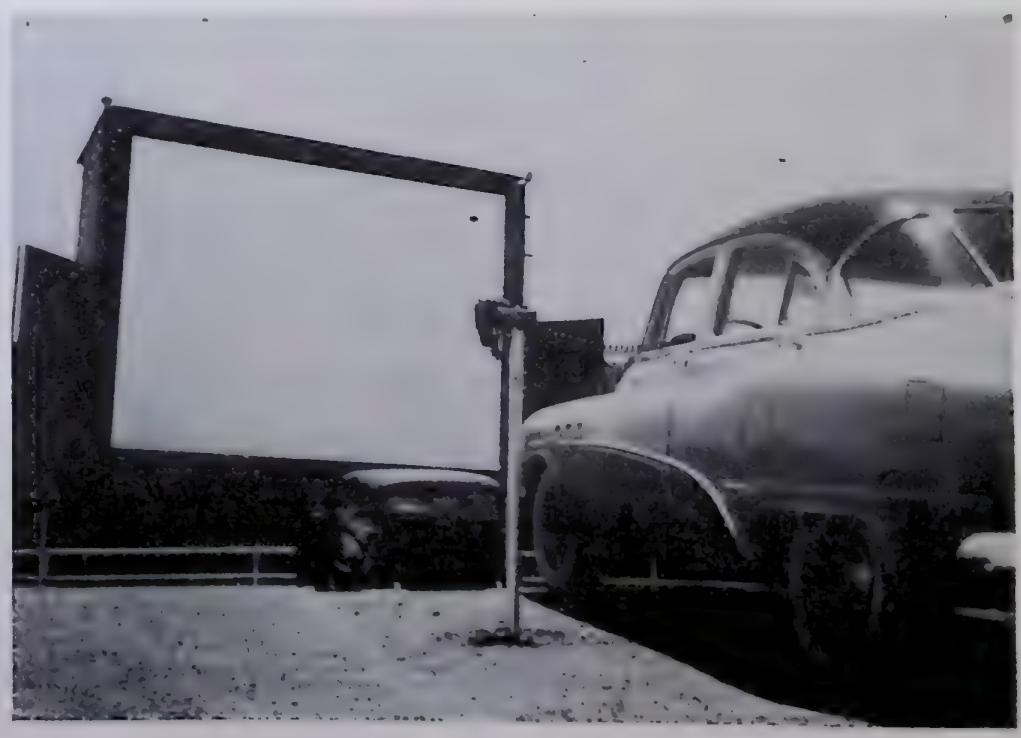
Grading

After all the rough dirt work was completed, sub-grading, underground utilities, and buildings were initiated. Sub-grading was advanced in such a manner as to maintain perfect drainage at all times. To create a water pocket or soft spot during this season of the year can hold up a job of this type for as much as two or three months. If this condition has developed and an effort is made to correct it without having proper weather conditions, it can get bigger and bigger, until a whole job is ruined; in this event, it would be necessary to wait until the dry season in order to advance. In the dry season the weather is just the opposite of the wet season—very dry and not even a sign of a precipitation.

Since the natural fall was from the rear of the theatre toward the screen tower, and final grades called for drainage to each side of the center line and toward screen tower, sub-grading and paving started at the rear of the theatre or the longest ramps. The soil is red clay and a 1-inch layer of quarry dust was applied as soon as sufficient sub-grade was ready, for the following reasons: (1) When it rained the sections that had this application could be worked without any shut-down time. (2) The dust stabilized the soil by serving to choke off the red clay, which kept it from working its way up through the six inches of water-bound macadam pavement during rolling and compacting. This one item saved the builder many a heartache, and eliminated many shut-down hours, which would otherwise have been necessary.

All main cable arteries to ramps and speaker posts cables were then installed. Ditching was done by the same motor grader (Caterpillar #12) doing the sub-grading, and at the same time pavement grading was in process. The speaker post cable loop holes were dug by hand. The above-mentioned three phases, i.e., sub-grading, ditching, and pavement tied together very nicely since the one grader was able to stay ahead of the rock quarry furnishing the rock for the pavement.

Pavement consisted of six inches water-bound macadam, applied in the following manner: First lift above the one inch of quarry dust consisted of crushed rock from sizes of 3 inches to 2 inches. Crushed rock of sizes from one inch to 2 inches made up the second lift, and the final lift was completed with size one inch to pea stone. RC2 Asphalt was then applied — 1 gallon per square meter, and a final coat of fine rock dust was then applied to serve as a binder and seal. One 10-ton and one 2½-ton roller was used during the entire operation.



THE PICTURE projected on Auto-Cine screen is 54 by 40 feet. Can be converted to wide screen.

Screen Tower

The screen tower, for 20 feet above natural ground, is constructed of reinforced concrete columns, and the beams above this level are of structural steel. The screen surface itself is of 6 by 6 by 12 inch cinder blocks. The first floor of the screen tower houses the warehouse; the second floor holds the office, and two more floors could be added for offices or an apartment. The back and sides of the screen tower are faced off with corrugated sheeting.

The Ticket Booth is of glass brick construction, and is located on the back end of the theatre.

This theatre is unique insofar as entrance and exit are in the rear rather than the front of the theatre, due to the general layout of the land. The entire enclosure is fenced with zinc corrugated roofing, with exotic tropical plants growing in profusion around the inside walls. The slopes are landscaped and sodded, both for beauty and to hold the slopes during rainy season.

Snack Bar

The Snack Bar building is 75 by 25 feet, with a patio in front extending out 16 by 50 feet. The patio is wonderful for the soft tropical nights and it is furnished with comfortable chairs that will seat 60 people. The customers like to sit on the patio while they're munching their hot dogs or hamburgers, or fried chicken, for they have no fear of getting food on the car cushions, and can watch the show at the same time. This is also good for the families with small children who get tired if confined in a car for too long a time.

The Snack Bar building also houses the projection booth. The owners are justly proud of this building, for it is of a beautiful and unique design. The back wall and complete counter are of stainless steel, and all of the equipment is new and modern. The counter is a straight one, running from wall to wall, and is 39 feet long. The whole front of the building consists of three huge plate glass picture windows, with two sliding doors furnishing the opening between them onto the patio. These doors are slid in front of the projection booth during show time, and it was necessary to cut only one square "peep hole" for the projector operator. The three interior walls are painted in soft glowing shades of green and brown. The lower walls and floor are all of tile, as is also the case in all other parts of the building, rest rooms, floor of the patio, halls, etc. This building is also built of concrete blocks, and the decorating was done by the contractor and manager.

The opening of this Bar made American hearts happy, for it is the first place in Panama that one has been able to get a real, good, American-style hamburger or hot dog, and the sales on these items are terrific. It has become an established custom now for many families to come to the Auto-Cine around 4:00 p.m. in the afternoon on Sundays to let the children run wild in the playground which is located on a beautiful grassy lot just below and in front of the screen, and which is equipped with swings, slides, and jungle gyms. This gives the older folks an opportunity to gather on the patio where they can keep a sharp eye on the "small fry" and still have ample leisure to catch up on the gossip and have a beer or coke before show time. About six, the kids are rounded up, and the family has Sunday dinner, still on the patio, and all are set for the movie when it starts at 6:45 p.m. For this reason, the theatre is opened at 3:00 p.m. on Sundays. Also, for those who don't wish to leave their cars, attendants are provided, with instantaneous service being the trade mark of the place. These attendants are summoned by a light on the speaker, which is operated by a switch, also on the speaker. The speakers are furnished by Westrex-Electric, and the light on the speaker is a fairly recent innovation.

SNACK bar building is 75 by 25 feet, and it has patio furnished to accommodate some 60 persons. Projection booth is also in the building.

EXPERIENCE WITH 3-D

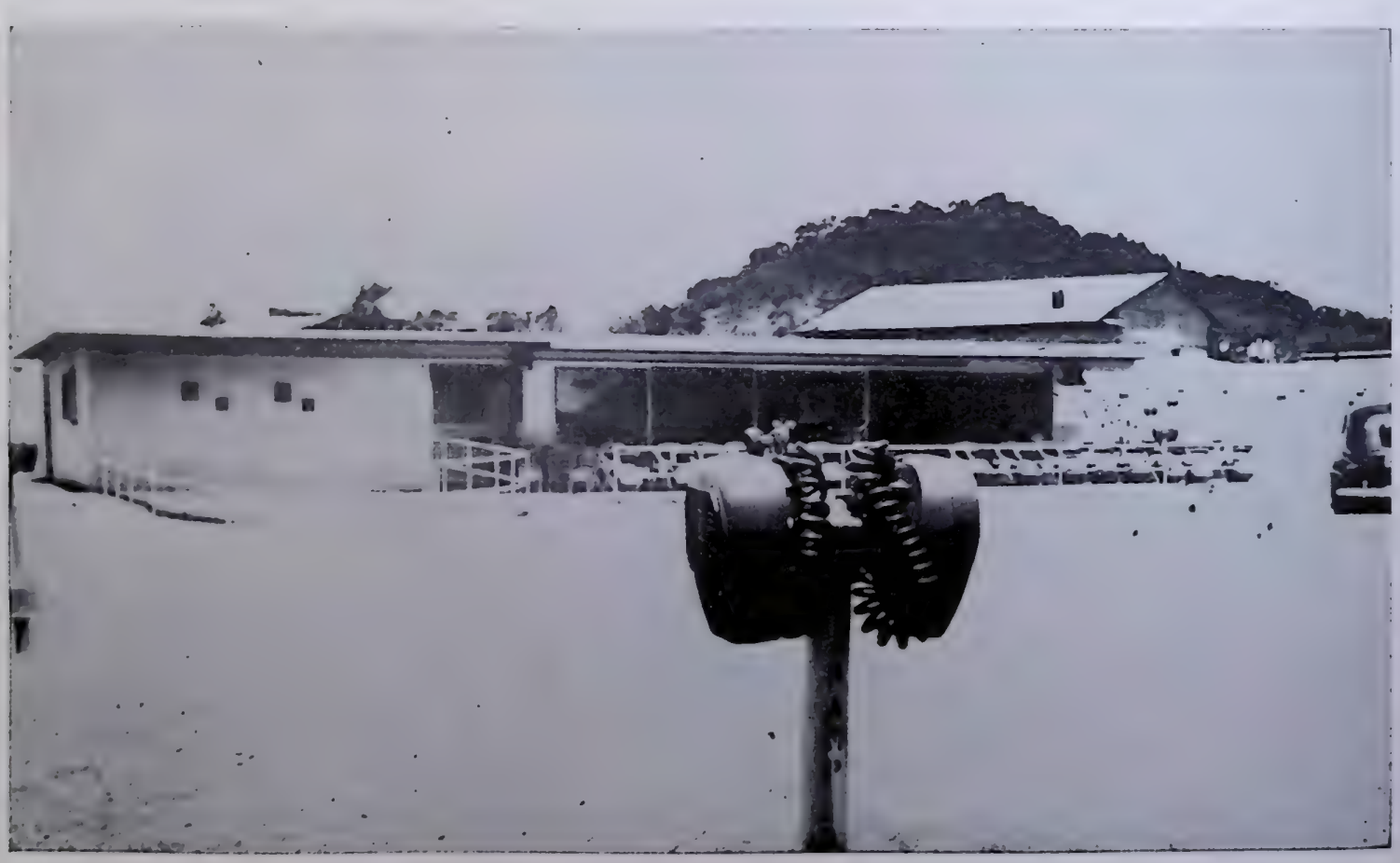
Projection change-over was standard procedure and we endured no difficulties in this respect other than a few mechanical details. We report only on the screen surfacing and elimination of the so-called checker board.

Our original screen surface was nothing more than cinder blocks 6 by 12 inches laid to an even surface with no plaster or special covering, painted with a regular Bondex flat white paint. Distance of projection is 242 feet and picture size is 54 by 40 feet. For texture and light, we believe our screen was perfect for the flat pictures. Our complete change-over to 3-D was accomplished without the loss of a single regular showing (two nightly).

Given below is each step of our experiments, with their corresponding results:

Step 1—Wednesday, April 8:

Having the projection equipment rigged we were able to obtain a 3-D print for a preliminary test on our existing flat white screen. This step was taken since we wanted to find out if the screen had to be repainted. As can be seen by this, we were really starting from



scratch, with absolutely no idea of what to do next.

Results: Reception appeared as if the machines were not in synchronization. More than one object appeared at the same time and the complete image blurred.

Step 2—Thursday, April 9:

We decided that it was important to repaint the screen since the previous test showed us that the machines were in synchronization. Since our existing base was a flat white paint, as previously explained, we decided that a rubber base paint, (Goodyear Pliolite Base S-5 with Aluminum metallic platting) was necessary. This paint was designed and mixed for us by a local paint manufacturer, and the screen was painted with it. We were again ready for the next test.

Results: Thursday our regular run feature on flat projection was very poor. Checker-board was very prominent. Every block and crevice on the screen could be seen, since it was somewhat irregular to begin with. Public reaction was not too critical since we announced previously that we were converting our screen for 3-D. We did not screen a 3-D film on this surface as we knew we had to correct the screen for the flat product.

Step 3—Friday, April 10:

Friday morning we had come to the conclusion that we had used a paint much too bright and had given the screen too much reflection. It was decided to make the paint much flatter or less brilliant. This was accomplished by using the same paint as used in Step 2, with an additive of Aluminum Stereate.

Results: Friday evening, the flat regular showing did not have the checker-board as prominent as in Step 2. On screening the 3-D picture, the checker-board still existed but not as prominent as with the flat picture. The reception on the 3-D was fair, but we knew we were still a long way from having all our problems solved.

Step 4—Saturday, April 11:

Since our flat picture was still very poor, we decided to get the paint more perfectly white—almost a pale light blue color. This was accomplished by using the same mixture as in the above step with an additive of flat white paint and Titanium.

Results: On Saturday evening our screen was perfect for the flat picture with more light, we believe, than with the original flat picture. However, with the addition of more light, we had lost a great deal of the picture's texture. On Monday, April 13, we again screened the 3-D picture and the results were again very poor; almost as bad as in Step 1. We then concluded that we had made the paint too white, giving us too much diffused light. I might add at this stage we were just about to give up the entire project and go back to our original screen.

Step 5—Tuesday, April 14:

The local paint manufacturer's chemist asked for one more chance to design a paint which he thought would work. He then designed a Fibrous Aluminum Bakelite Base paint to cover his previous rubber-base paint, with a great quantity of metallic added.

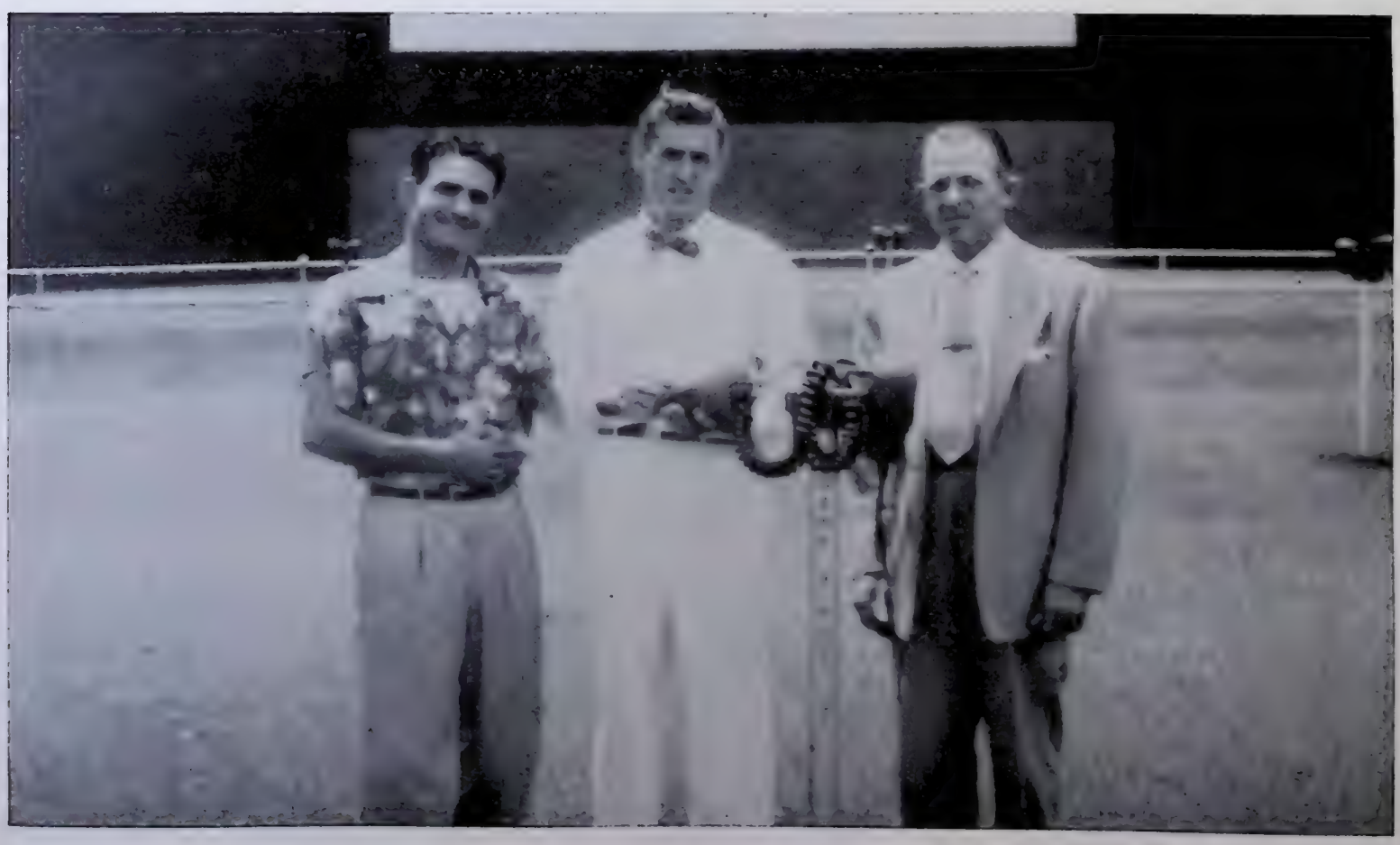
Results: Tuesday night our reception was perfect for both flat pictures and 3-D, with very few horizontal and vertical paint laps showing. We finally had eliminated the checker-board and vertical and horizontal laps. Note: Previous paints, due to very quick drying qualities, had made horizontal and vertical paint laps. We then finishing on Wednesday with another coat of the same material and now have a perfect screen for flat and 3-D product.

Wide Screen

We have now decided to tackle the wide screen and are awaiting our States inquiries as to materials suitable for screen covering. We have gone ahead with the unscheduled planning for a wide screen frame to be mounted on mono-rails to the existing screen tower, with additional pipe columns to be installed on each side of the screen tower to give the necessary width. We believe that with this method we could install a screen of any width desired, which could then be rolled away, making use of our existing screen for all or any of the processes on the market which would be adaptable to it.

During construction of the frame for the wide screen, it could be built without any closing-down time on the theatre. However, we feel that in the event it is decided that the wide screen will take care of all the processes, we could still build a wide screen, and still use the above-described method of mono-rail. The whole frame could then be moved into place in a fixed position. The latter method would be cheaper to install due to cheaper construction method, but there would still be no shut-down time for the theatre.

THE MEN who were responsible for the building and operating of the Auto-Cine Drive-In are seen here. Seen, from left to right, Elton Todd; Paul W. Kayers, Panama branch manager for Westrex Company; and the author, Joseph Putaturo, vice-president and the general sales manager.



Wide Screens For Drive-Ins

An Analysis of the Various Factors to be Considered In Construction of Wide Screen Towers for Drive-Ins

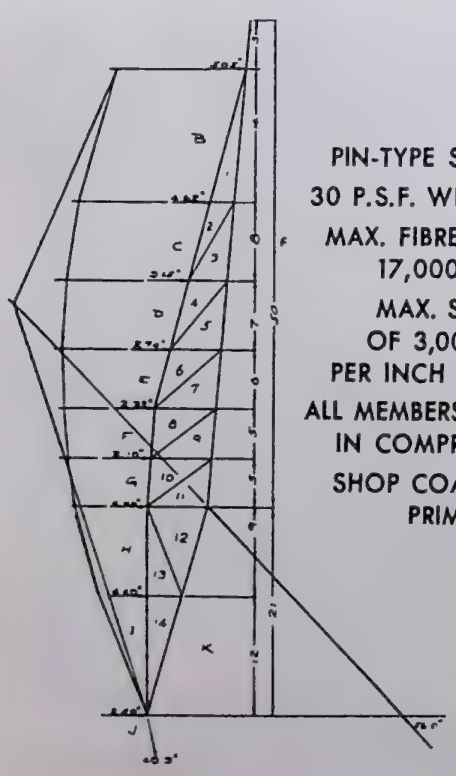
By JOHN SELBY
President, Selby Industries, Inc.

BRIEF: *When it became apparent that the wide screen . . . and particularly CinemaScope . . . would come into widespread use . . . it quickly became clear that the thousands of drive-in theatres could not be excluded . . . However . . . the problems of installing a wide screen system in an outdoor theatre are much greater than in the conventional motion picture theatre . . . One of the major areas of difficulty is the screen tower . . . In most cases it is necessary to more than double the screen size . . . and this involves many knotty problems.*

This article . . . which has been prepared by one of the leading experts in the construction of drive-in screens . . . underlines the most important factors to be considered when erecting a new wide screen tower . . . The author covers such points as curvature . . . tilt . . . optics . . . wind load . . . and safety factors . . . The drive-in operator who is thinking of installing a wide screen owes it to himself to take advantage of the information to be found herein.

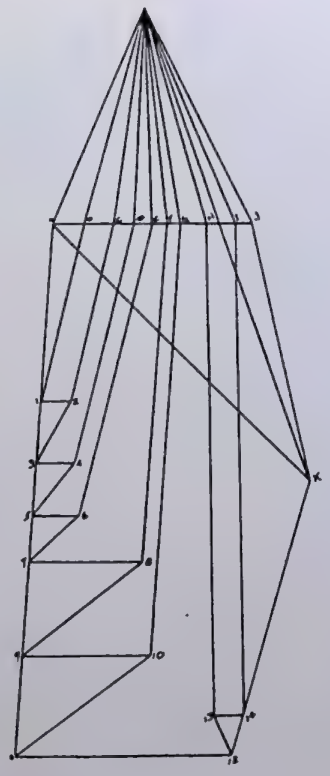
When CinemaScope, and the other wide screen systems made their bow the average drive-in operator probably felt that he would just have to be a spectator, since it appeared that the equipment necessary for the showing of a process like CinemaScope could never practically be adapted for the outdoors. However, as the wide screen came into popular favor, and as the early CinemaScope productions began to break house records all over the country in conventional theatres, it was obvious that the outdoor theatre could not be excluded for a very long period of time. One of the major barriers was hurdled when the restriction of CinemaScope to only those theatres equipped with stereophonic sound, was lifted.

Manufacturers began to improve and adapt their equipment to meet the demands of wide screen projection in the drive-in. The greatest problem appeared to center around the screen tower. The primary question was, "can we erect screens of the size and shape necessary to project in the proper aspect ratio and still make them safe from an engineering point of view?" The ever increasing number of drive-ins that are playing CinemaScope product today testifies that this problem is being licked.



PIN-TYPE STRUCTURE
30 P.S.F. WIND RATING
MAX. FIBRE STRESS—
17,000 P.S.I.
MAX. STRESS
OF 3,000 LBS.
PER INCH OF WELD
ALL MEMBERS DESIGNED
IN COMPRESSION
SHOP COAT METAL
PRIMER

SCALE LINE DIAGRAM



COMBINED FUNICULAR POLYGON AND MAXWELL STRESS DIAGRAM

Factors to Be Considered

It is important to remember that the "new look" of drive-in theatre screen towers is not only an increase in the aspect ratio size for CinemaScope, but also increased size curvature and tilt.

A typical 700 to 900 car drive-in, equipped for the anamorphic process, is now using a picture size of perhaps 45 by 100 feet—this is more than twice the former size, in most cases. The additional light that is required for this larger area may be obtained partly from larger lamphouses, faster lenses, and longer projection throws. A projection throw of 350 to 400 feet appears to be best for the average picture since it permits the use of the most efficient four inch focal length lenses for wide screen, and six inch base lenses for CinemaScope. To attempt a larger picture with the old 225 foot throw would make it necessary for the projectionist to use focal lengths much too short for maximum light transmission and good resolution. Since light and resolution are perhaps the two most difficult things to obtain in wide screen projection, it is easy to understand why the use of the proper focal length lenses is of such importance.

Tilt and Curvature

Although the taking of the steps just discussed are valuable contributing factors, the major increase in picture brightness is achieved by concentrating reflected light projected to the screen, and back to the customers, by proper tilt and curvature of the screen tower. Tilting the screen to an angle equal to the projection angle, and curving to a radius equal to the projection throw reflects light to the area of maximum car density, rather than to the sky or to the side areas. Curving is also important to achieve uniformity of brightness on the far side areas.

The value of directed reflection is greater with gloss surfaces. Flat diffusing surfaces, such as dead flat white paint (when dry) require the least precision, but conversely, are the lowest in efficiency.

Optical Functions

In designing and building a drive-in screen tower structure, a full understanding of its optical function is necessary, for the curvature and tilt of the steelwork forms the giant reflector surface.

The exhibitor who is installing a wide screen tower in a new theatre must understand the need for a long enough

THIS DIAGRAM illustrates how a drive-in screen tower should be constructed so that it will be strong enough to withstand a heavy wind storm.

throw. However, this factor is of even greater importance when rebuilding towers in already constructed theatres. In most cases the throw must generally be increased by locating the new tower farther from the booth in order to add the needed distance. It is for that reason that replacement towers built by the author have always been located behind the old tower. In those theatres having a short projection throw, the widening of a screen in its present location may very well be limited by the focal length of the lens required to do excessive magnification. Quite often this means going into the rather inefficient range of two or two and one-half inch focal length lenses.

Tower Trusses

The strength of the tower trusses is determined by simple engineering mathematics, and should be based on an assumed wind load of 30 pounds per square foot of surface plus—and this is very important—a factor of safety of at least 50 per cent. Some "bargain" towers are rated at 25 pounds per square foot and a 33 per cent safety factor.

The exhibitor may choose what "calculated risk" he is willing to assume in his strength rating, but as at the drugstore, the "giant economy size" is the best value. The New England hurricanes of September, 1954, had winds of 125 miles per hour, but there was not a single report of damage to the towers which the author had constructed in that area using the wind loads and safety factor described above.

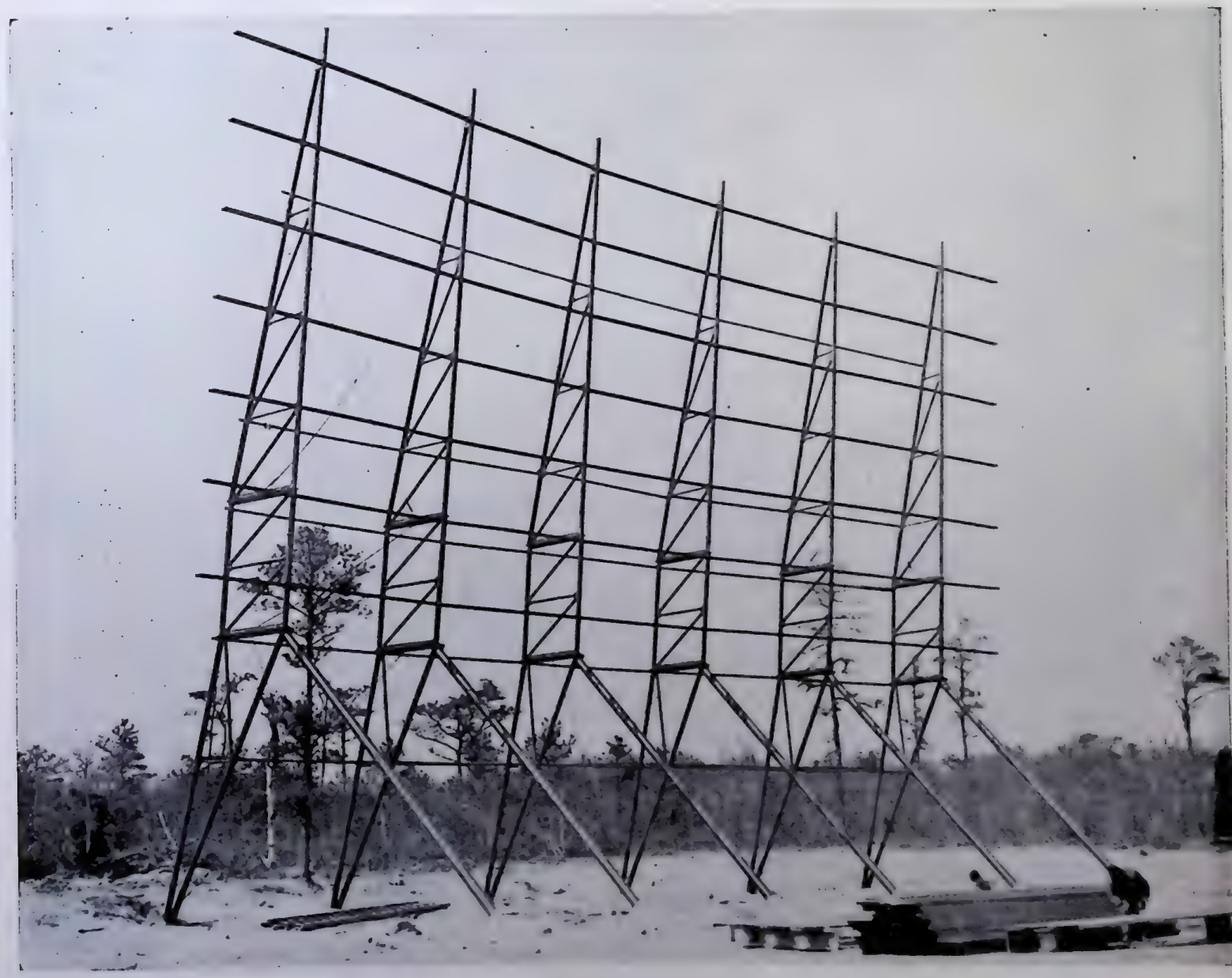
In this era of widening of old towers, a few jobs have come to our attention where strength has been disregarded by some local carpenter who can "very cleverly" add height or add wings by wood framing beyond the original tower, without the use of new trusses to transmit the added wind area to the ground. Obviously, this is not getting something for nothing, but is simply reducing the strength rating to cause a failure at a much lower wind velocity. Therefore, what may seem like a very economical way to bring the wide screen to your drive-in might result in having the entire tower structure collapse in winds which had previously done no damage at all. In addition, by merely adding these wings without making the proper provision for curvature, tilt and optics, it might be discovered that the front ramps are no longer useable, since it will be impossible to properly view the wider screen.

HERE is the skeleton of a new D-I wide screen tower. The two most important factors to be considered are curve and tilt, and wind load.

CONCLUSION

Two factors, then, must be taken in consideration in the purchasing of either a new or enlarged screen. First, the designer must understand the optical requirements. Tilting and curving alone are not enough—the screen should be looked at as an engineered reflector prepared for each individual theatre, according to up-to-minute technical developments. Secondly, the wind resistance must be high enough to enable the tower to withstand the highest winds recorded in the particular area in which the drive-in is located.

All this can be most easily accomplished through a specialist in theatre screen tower design and construction, for by his quantity of production from standard jigs, prices for quality can be held low. And as a bonus, there is the assurance that all technical and optical factors will be right.



Painting the Drive-In

The Proper Use of Paints and Color at the Outdoor Theatre Often Results in an Increase in Activity at the Boxoffice

By MICHAEL E. SPATZ
President, Spatz Paint Industries, Inc.

BRIEF: ***Since most areas of the drive-in theatre are at the mercy of the elements to a much greater extent than conventional houses . . . it is of great importance that the fences . . . screen tower . . . concession buildings . . . etc. . . . be given as much protection against the wearing effects of weather as possible . . . One of the most economical and effective methods of achieving this end is by keeping the drive-in properly painted . . . This article discusses the importance of painting . . . as well as giving valuable information on what the paint requirements are for various areas of the theatre.***

There is also an important section devoted to a discussion of paints for screen surfaces . . . as well as its use as a decorating tool . . . The author offers suggestions on how and what colors would be best for individual areas of the drive-in . . . An item of particular interest is a new product which can be used to glamorize and highlight the outdoor theatre at a minimum of expense and bother.

While comparatively recent in development, drive-in theatres are now a permanent part of the theatre business. They have come of age and with growth comes new responsibilities to the ever-increasing number of customers who patronize them.

As early as 1948 our company, equipped with considerable background and experience in the manufacture of paints, came to the conclusion that if true fidelity of the projected picture was to be retained, something more than just the ordinary flat white paint then being labeled and sold as screen paint, was required. Many manufacturers then, as now, find the field too limited to bother with formulating the special paint required. Be that as it may, we at Spatz instituted a program of exhaustive research and development, and by the end of 1949 felt that we had found the formula which would do the job. Our research and analysis were correct, for today this paint is internationally recognized and accepted, and provides efficient pictures for two to three years.

In March of 1953 when 3-D became the rage, drive-in theatre owners, eager to hop aboard the 3-D band wagon, again found themselves groping for a paint which would satisfactorily reflect this new type of picture. The results obtained from standard screen paints were not satisfactory. It was found that a metallic base paint, with some chemical variations which we had developed, proved fairly satisfactory for both 2-D and 3-D, and that in most cases, two coats applied by roller or spray completed the job.

Prime Coats Are Important

One very important factor in obtaining best results from finish paints is the preparation and priming of surfaces to be covered. Simply leaving it to luck or taking the advice of individuals who are unfamiliar with the requirements, can be unpleasant and costly. For example, on one large screen made from galvanized iron sheets, the painters used a zinc chromate primer. The proper coating should have been zinc dust primer. After just eight months, the primer and finish began peeling and the paint had to be removed and the entire screen recoated. The selection of proper primers, that will satisfactorily undercoat a recommended finish paint, is part of a program developed by our company.

Recommendations For Screens

Two of the most common types of paint currently in use on drive-in screens are interior flat wall and oil base concrete paint. Consequently, many screens are being repainted twice each season needlessly. Maintenance and upkeep costs take a substantial portion of the exhibitors' profit. Unwise selections of paints can, and will boost those costs. A few words of caution to any who are contemplating a screen paint job. On new screens, select the primer coat that meets the requirements of your screen —they vary. Fir plywood, galvanized iron, asbestos shingle, concrete or stucco all differ and should be treated as follows:

New Fir Plywood

a. Prime—Metallic-oil primer for bare wood.
b. Second Coat — Free flowing zinc-free house paint primer.

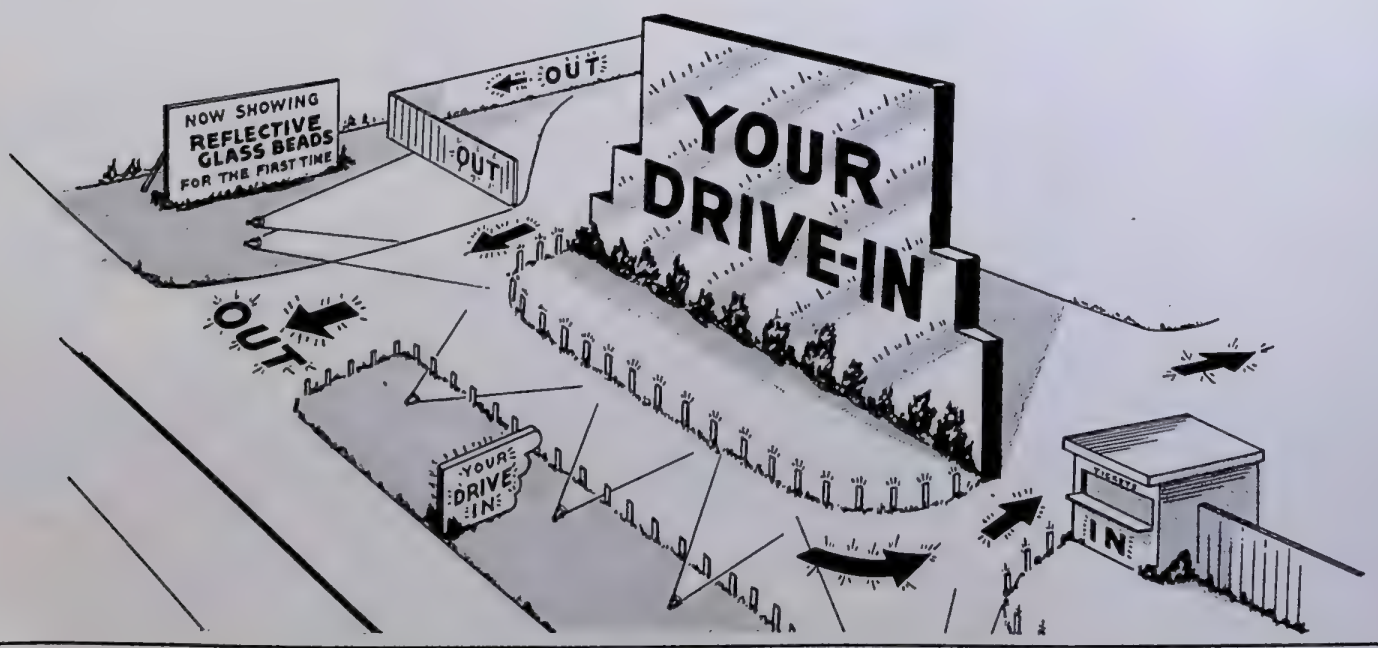
New Galvanized Iron

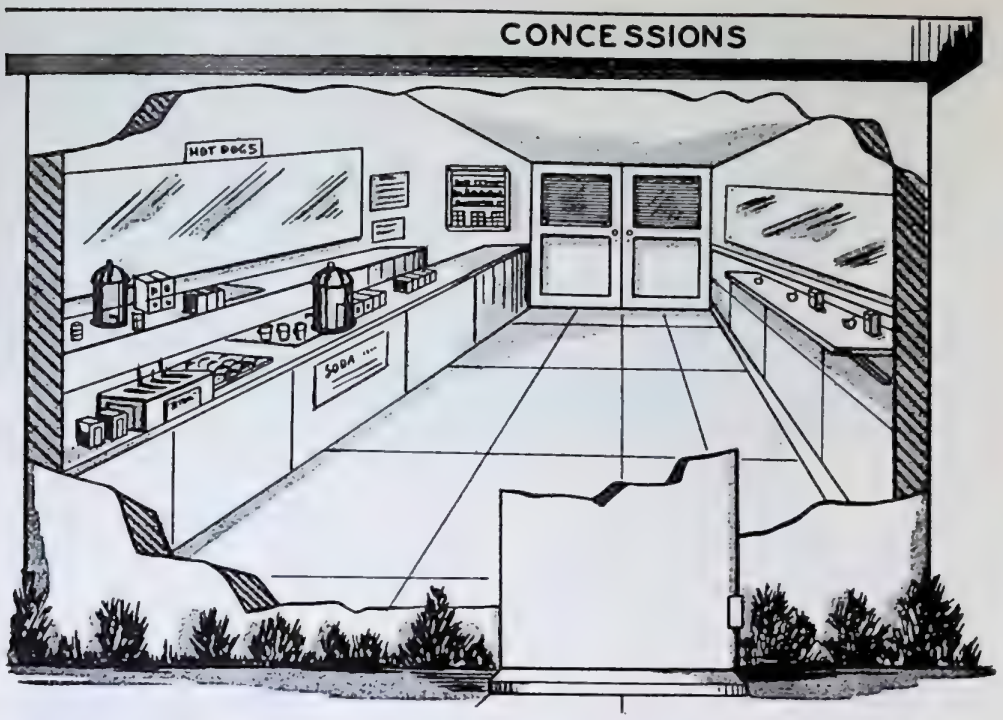
a. Prime — Zinc-free house paint primer.

Screens—Finish

New screens primed as shown above, and previously painted screens, regardless of kind or type:

THE USE of glass beads and colored basecoat paint can have many uses in the drive-in theatre. It can be used on road marking posts, on signs, etc.





THIS SKETCH illustrates the various areas of the concession building that requires different types of paints that are designed for the job.

a. Finish — Glare-free white special flat exterior.
b. Finish — 3-D, 2D, Wide Screen — Lap-free, whiter metallic coating. Has higher reflectivity than 3-D aluminum paints. Permits earlier showing. Two coats of finish are usually required for maximum satisfaction.

Color Builds Business

Colors with appeal sell merchandise. Colors can attract theatre-goers and invite them to return. By all means, use color in your drive-in, but use it wisely. The outdoor theatre exhibitor should be imaginative and exacting in planning the colors for his painting program. People expect colors in theatres to be exciting, different and dramatic; see to it that *yours* are. Give them the newest colors available, and don't be afraid to stay on the "loud" side. Try painting your concession stand walls yellow-gold and brigadoon green. Try powder-pink and ballerina green in the ladies' room. Use contrast. Where walls are dark, make ceilings white—it makes up for light lost on dark walls and seemingly heightens ceilings. Use color well and you will hear pleasant comments.

What type of paint is best for interior walls? Rubber latex? Oil base? Alkyd flat? These three types are similar except for one feature. Alkyd flat cures in 24 hours and may be scrubbed the day after it is applied. Rubber latex must be allowed to set for six weeks, oil base 60 to 90 days. Freshen up your walls with Alkyd flat and finger marks and rest room artists will be no problem.

The exterior of the concession building should be an absolute flat. The reason for this is that it minimizes the glare from headlights. A concession stand 40 by 60 feet, 10 feet high, will use approximately five gallons of paint for one coat. For new unpainted surfaces, the exterior should first be primed with any good house paint primer.

The wood fences in a drive-in should be painted with a flat-drying paint, and one that contains a wood preservative. A simple method of estimating how much paint will be required to paint a fence is as follows: measure the length of the fence, multiply by the height and divide by 400. This will give the number of gallons needed for one side of the fence. Four gallons will paint the inside of a fence eight feet high and 200 feet long.

Speakers and speaker posts are subject to considerable abuse, both from the elements and the public, and therefore require a tough elastic finish. Aluminum or gray enamel is suggested for this part of the drive-in. One gallon will paint approximately 20 speakers and 20 posts.

A NEW PRODUCT

We are particularly happy about a product just developed. It combines the use of glass beads and colored base-coat paint. It glamorizes and emphasizes the drive-in property and reduces the need for expensive neon tubing designs and signs. All that need be done is to simply brush on a coat of reflective base-coat paint in the color and design desired, and while the paint is still "tacky" apply the beading. Place spots or flood lights properly and you have a million little colored lights working for you. Imagine the front of a screen tower striped yellow, red, and blue over white and coated with beads. Properly illuminated, the tower and signs would be visible for miles.

Many Uses

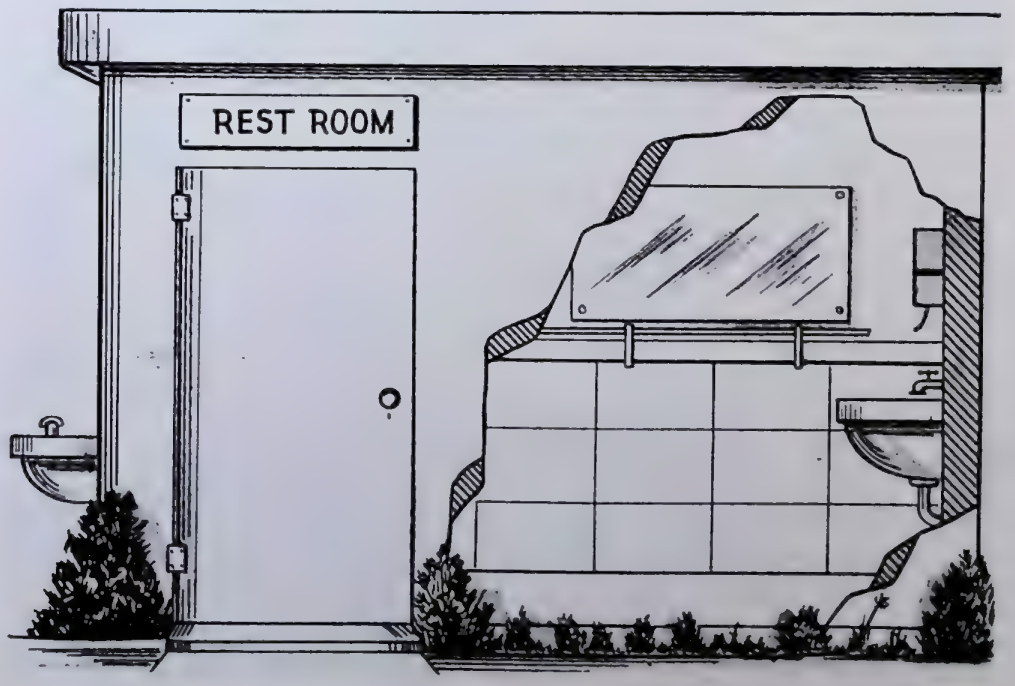
The use of reflective type paint around the drive-in theatre is unlimited. With road marking paint you can have illuminated directional lines on roads. It can be used on road marking posts, on signs, on speaker posts, and as trim on buildings.

For example, when used as a road marking one gallon of road marking paint will lay 600 linear feet of line, four inches wide. Five pounds of reflective beads are required for sprinkling one gallon of paint.

If speaker posts or speakers have painted numbers, or if you want them to glow for easy identification, you may apply reflective beads both for utility and for added decoration.

In order to supply a screen tower with this economical means of illumination you would require six gallons of bead base coating for a front of 40 by 60 feet, and 30 pounds of reflective beads.

Paint makes a difference, but the kind and type used often makes that difference. In appearance, durability, and in dollars and cents. Investigate before you paint. Advance planning pays off.



ANOTHER IMPORTANT area of the outdoor theatre that requires advance planning when it comes to selection of correct paints is the rest room.

Heating the Drive-In

Use of In-Car Heaters for Outdoor Theatres Can Make It Possible to Extend the Drive-In Season

By E. A. Farr
Chief Engineer, Arvin Industries, Inc.

Operators of drive-in theatres have traditionally been at the mercy of the weather. A late, cold and wet spring in most parts of the country meant a delay perhaps of weeks in opening. Conversely, an early fall with freezing weather brought a darkened theatre with sacrifice of days or weeks of profitable operation.

BRIEF: ***One of the problems which has faced many operators of outdoor theatres . . . is how to extend their season . . . Many times profits for the year would be almost doubled if it were possible to operate 12 months out of the year . . . The problem of closing and opening . . . and getting a new staff each season . . . is also one which is the cause of much difficulty . . . In most parts of the country the winter is usually not so cold as to make it impossible to operate if a practical method of keeping the occupants of the cars warm could be had at a reasonable cost and operation.***

This article discusses the use of electric in-car heaters as an answer to the problem of keeping the drive-in open a full season . . . It discusses what goes into the making of a good heater . . . as well as how to distribute and repair the heaters . . . There is an interesting section devoted to the actual case history of the use of heaters in two drive-ins . . . under different weather conditions.

Even with normally good weather in both spring and fall, operators throughout the temperate and cold belts were accustomed to several months of seeing their big investments stand idle and unproductive. An added disadvantage of short and interrupted seasons was the problem of recruiting and retaining qualified employees for jobs that were known in the labor market to be seasonal and subject to protracted layoffs.

Extending Seasons

Many operators were inclined to accept these conditions as a necessary hazard of the trade. But a few aggressive owners, with a keen sense of merchandising, actively sought ways and means of extending their seasons and with this in mind proposed the idea of providing heated cars for their customers by means of portable electric heaters.

Other means of keeping cars warm had been tried, such as providing the patron with a gallon or two of gasoline so the regular car heater could be operated during the show, but the hazard of carbon monoxide fumes in cars with windows closed quickly discouraged this idea.

Two operators in particular, one in Cincinnati, operating a 2300-car drive-in, and another in Louisville, with an 1100-car capacity, were primarily responsible for starting the ball rolling with an intensive program of engineering research and development that finally led to the wiring of their properties for in-car electric heaters and development of a heater specifically designed for in-car use.

ELECTRIC HEATERS

Fortunately, a compact, lightweight, portable electric room heater of the general size and type desired was already available as the basis for these tests. This heater was an outgrowth of 20 years of experience in building fan-forced portable room heaters.

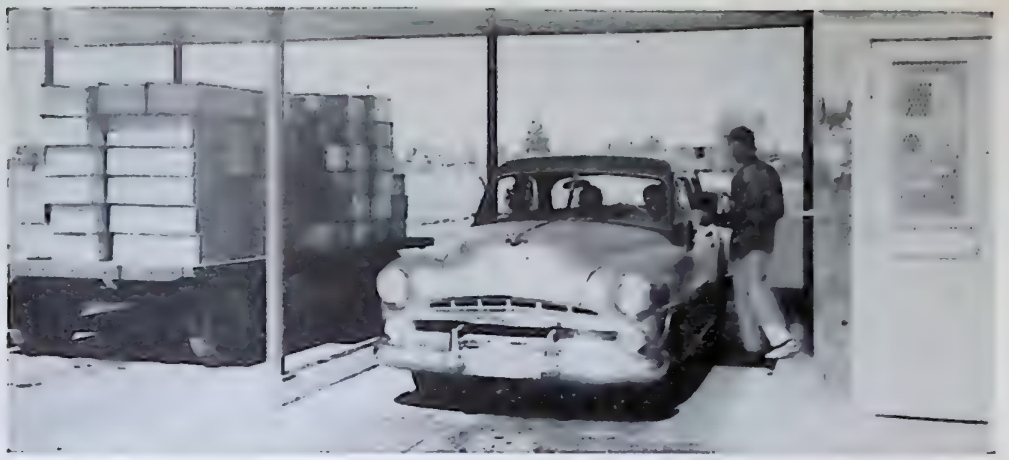
Starting with this basic heater, many modifications in design were made to adapt it for the rugged usage encountered in drive-in theatres. As our joint experiments progressed, it became evident that the ideal in-car heater should embody all the following features:

Compact size and light weight. The final result is an all-steel heater only seven and one-half inches high and five inches deep with one and one-half inch extended guard rails. Weight of five pounds two ounces permits easy handling, even by a small child.

Heat should be fan-forced for most efficient circulation.



THE HEATER, placed on floor of car, heats both front and rear areas adequately. An eleven foot line cord comes in over slightly lowered window.



DISTRIBUTION of heaters is simplified through use of a flatbed truck that holds nesting metal boxes, each one containing eight in-car heaters.

Electrical characteristics: 500 watts, 208 volts, for operation on 60-cycle alternating current. Plug is 3-contact polarized type.

Attractive yet durable finish: The final product is finished in scratch-resistant, sun-tan baked-on enamel.

On-off switch for ready control by car occupants.

Adequate line cord length to permit plug-in of heater on speaker post and placing heater on floor in either front or rear of car as desired. Eleven feet was found to be a practical length.

Induction type motor for greatest efficiency plus quiet operation and no interference with speaker sound.

Oil-Lite bearings for life-time lubrication.

Nickel and chrome alloy heating element.

Two-blade aluminum fan.

Double fusing of each heater for complete protection and case-grounding of neutral line for safety and no shock hazard.

Three rubber feet to keep heater stable on irregular surface.

The heater with these features did not spring full-blown from our lab and factory. Instead, it grew slowly out of tests by trial and error in actual operation in these two big theatres in Cincinnati and Louisville over a period of nearly four years.

TRIAL AND ERROR

The first heaters went into use in Cincinnati on a cold and snowy March 1, 1950. The theatre stayed open every remaining month that year—ten months of operation—and with more than twice the gross receipts of 1949. And in 1951, 1952 and 1953 the theatre operated 12 full months with a substantial increase in revenue and profits each year over the preceding year. Although this theatre was already built and in operation and the ground had to be torn up for rewiring, the owner states that this installation paid for itself in two years. It seems reasonably evident that an in-car heater program will, in the slogan of the trade, "Keep the Habit-Going Public in the Habit 12 Months a Year."

Experience In Louisville

The experience of the Louisville operator is equally encouraging for operators who see heated cars as the answer to their seasonal problem. This 1100-car operation equipped 750 speaker posts for heaters and is now staying open 12 months with profitable business each month.

Cincinnati and Louisville are in a temperate weather zone in which in-car heaters may be expected to operate successfully to keep outdoor theatres open year-round. The success of such operations in any locations farther south is virtually assured. In December of 1953 an installation was made in a theatre near Gary, Indiana, in the extreme northern end of the state. At this writing the installation has been in operation only a few weeks, but early reports indicate that this theatre is open every night and enjoying heavy traffic during a normal winter.

Many questions, of course, occur to anyone who may be thinking of a wiring program. The cost of rewiring a theatre already built must be weighed against the added revenue to be gained from a longer season with greater patronage. In the case of new construction this cost is materially less. A simple, practical wiring diagram for a typical drive-in is available on request from any theatre operator.

What about temperature rise in the car? No statement can be made that will apply universally because of all the variables involved, such as age and weather-tightness of the car, wind velocity, pre-heating of the car from its own heater, etc. But it may be said that under average or typical conditions the in-car heater will raise car temperatures in sub-freezing weather to a comfortable level within a few minutes.

The question of frosting the windshield has been raised. Experience of several years indicates that this is no problem.

Heater Distribution

How are heaters distributed and recovered? A simple and practical method is to load the heaters about eight to a box in nesting metal boxes which are easily and cheaply fabricated, perhaps in the theatre's own maintenance department. Haul these boxes on a flat-bed truck to the boxoffice and distribute heaters individually to cars as they drive in. Heaters are reloaded into the boxes as cars leave after the performance.

Experience at Cincinnati and Louisville over several years shows that loss of heaters and damage are negligible. At both these cities heaters are offered to patrons from about November 1 to May 1—six months of daily use. They report that 99 per cent of patrons appreciate the service and take good care of the heaters. Of course, the heaters are so wired that they are useless for household installation.

One operator keeps tab on his heaters by placing a card or tag on any car that doesn't want a heater. Outgoing cars then must deliver either a heater or the card.

CONCLUSION

Proper advertising and promotion of the in-car heater service is, of course, highly important. Newspapers, programs, marquee announcement, screen slides and public address system announcements are all effectively used both to inform the public of the availability of heaters and to tell patrons how to handle and use them.

The entire idea of heated cars is so new that it is perhaps too early to assess accurately the future of this development. However, if the experiences of the operators who have tried this service are an indication, in-car heaters may well prove the key to keeping the marquees lighted on many drive-ins all-year-round so that your patrons will love you in December as they did in May.



WHEN THE patrons leave the drive-in the heaters are returned to the boxes to be used once more.

Chemical Fly Swatters

Drive-Ins That Use Recently Developed Chemicals, and Proper Sanitation Procedures Eliminate Danger of Weeds and Insects

BRIEF: *The outdoor theatre operator must always be constantly on guard against the growth of weeds . . . which detract from the appearance of his theatre and might even result in creating short circuits in the speaker post wiring systems . . . He must also wage a continuous battle against the development of the pesky mosquito and fly . . . This can be accomplished without undue expense or bother . . . with the help of modern equipment and use of the new weapons that science has developed in recent years.*

This article discusses some of the common hazards which aid the growth of weeds and the breeding of insects and pests . . . It also indicates some of the latest chemical preparations which have been especially designed to eliminate these hazards.

One important point which is brought out is that proper equipment . . . and trained experts should be used in order to get the most satisfactory results . . . Another valuable reminder is that even the use of the finest machinery and the latest preparations will be of no value if the grounds are not put in good shape at the start of the season . . . and maintained that way . . . The combination of good sanitation practices and the right insecticides will result in pest-free outdoor theatres . . . and eliminate the chance of losing patrons because of unsightly grounds . . . and annoying pests.

Outdoor living brings with it the problems of bugs and weeds—and drive-in theatres are no exception. Weeds are sometimes defined as "plants out of place" and they can find many wrong places around a drive-in theatre lot. As for insects, probably the two worst pests are flies and mosquitoes. One jet invasion of a swarm of mosquitoes can spoil an outdoor theatre party in a hurry.

Control of both insects and weeds is largely a sanitation problem. Weeds often shelter breeding places for various kinds of insects, as well as being a problem in themselves. They also harbor rats, mice, and other rodents, and may hold enough moisture to increase rusting and wood decay. A gust of wind may fill a weed patch full of litter, and then the vegetation interferes with the clean-up crew. In addition, of course, weeds and tufts of grass or clumps of brush give the grounds an unkempt appearance, and may seriously increase the risk of fire.

CHEMICAL WEED KILLERS

Weeds, grass, and scrub growth may be a problem wherever there is enough moisture and fertility to permit a plant to grow. Around speaker stands, parking ramps, platforms, gate-posts and fence-lines—these are some of the places where weeds are often a problem in drive-in maintenance. Around electrical installations, they may grow high enough to short-circuit a line. And hay fever sufferers will avoid your theatre for several weeks or more if they suspect the air may be full of ragweed pollen.

Where labor costs must be considered, the use of chemical weed killers is economical. Modern chemicals can be easily applied by any maintenance crew, and the investment in equipment and materials is repaid many times over.

Hiring a custom applicator has the advantage of providing at reasonable rates, trained personnel thoroughly familiar with chemicals and able to supply the equipment for applying them.

Specialists

Chemical weed killers are "specialists" and it is important to select the right material for the job to be done. Some, like 2, 4-D and related chemicals, are "selective." That is, they will kill certain broadleaved species of plants, while grasses continue normal growth. Then there is "Ammate" weed and brush killer, which is specific for killing poison ivy and other woody plants. Sprayed on the foliage it kills the whole plant.

"Soil sterilants" are used where it is desirable to control all plant growth. One chemical that meets major requirements for the "soil sterilant" class is "Telvar" W Weed Killer. This material is a powder to be mixed with water. A cupful in two

THE TRAIL DRIVE-IN, Houston, Tex., uses "Swingfog," a portable pulse-jet device offered by Devenco, Inc., with a liquid insecticide as part of its equipment for the control of weeds and pesky insects.



gallons of water is enough to control weeds on a 200 square foot area for an entire season or longer. It is non-volatile, non-flammable, and low in toxicity to people or animals under conditions recommended for use. A season's supply can be stored in a small space.

"Telvar" W weed killer works principally through the roots, so it should be applied when there will be enough rainfall to carry the chemical down into the root zone. Applied in the spring, before growth starts, it will prevent plant growth throughout the season.

"Telvar" W may be applied to dense weed growth provided sufficient water is used. But better results are usually obtained if vegetation is mowed and matted growth cleared away, in order to apply the material on the ground.

"Telvar" W can be applied with power sprayers suitable for wettable powder mixtures. The sprayer should have continuous agitation to keep the chemical in suspension, and all openings in screen and line strainers should be equal to or larger than 50 mesh.

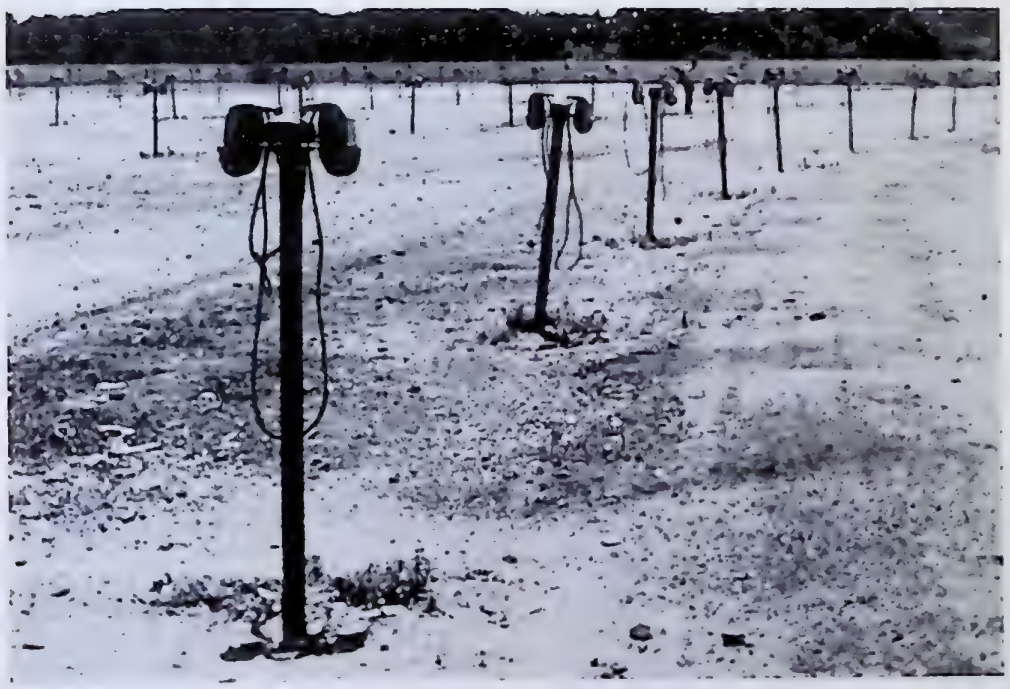
Uniform coverage is essential. Areas missed by the sprayer may show normal growth unless roots extend into the treated area. Usual recommendations are one pound per 1,000 square feet or about 40 pounds per acre to achieve control for one season or longer. Where hard-to-kill weeds such as established deep-rooted perennials are present, or where longer control is desired, up to twice this dosage may be necessary.

PRECAUTIONS WITH WEED KILLERS

With all herbicides, certain precautions are necessary. Do not spray weed killers on or near valuable plants or trees or in areas into which their roots may extend. Do not treat locations from which the chemical may be washed into areas where roots of desirable plants may come in contact with the chemical. Apply chemicals with care to prevent the spray or dry powder from drifting onto lawns, shrubbery, gardens, trees, or cropland. When working around irrigation systems, be careful not to contaminate the water with weed killer.

Weed killers may also contaminate fertilizers, insecticides, fungicides, or seeds, so they should be kept separate—in storage and in use. Sprayers which have been used for weed killers should not be used for spraying insecticides, fungicides or fertilizers on crops, ornamentals, lawns, etc. After you have used a "soil sterilant," be sure to clean the tank, pump and all lines, booms, and nozzles before using the same equipment to apply other weed killers to crops, lawns, or ornamentals.

In the hands of qualified applicators, chemical weed killers have become an important tool in sanitation and maintenance. They do a thorough job with minimum labor cost.





AN EXAMPLE OF HOW WEEDS may be controlled can be seen in these two illustrations. The photo above shows speaker stands at a Massachusetts drive-in, where clumps of weeds are growing around the base. The illustration below shows the same theatre after the speaker posts have been treated.

CHEMICAL FLY SWATTERS

When DDT was released for civilian use after World War II, drive-in managers were among those who thought the fly and mosquito problem was over. A few puffs of this magic stuff seemed enough to keep the grounds free of flies, mosquitoes, and even ticks and other insects for most of the season.

But it soon turned out that chemicals were no substitute for good sanitary practices. Both flies and mosquitoes began to show natural resistance to DDT and some related chemicals. It took heavier dosages to do the job, and still the bugs came back faster than they had in the beginning.

Some new and more potent chemicals are on the horizon, but they are only in the experimental stage. Meanwhile, what can you do around your theatre to keep down flies and mosquitoes?

The first place to tackle fly and mosquito problems is at the breeding places. By cleaning up breeding places, you cut down the number of insects that have to be killed during the season—and make the job easier.

Houseflies breed in decaying organic matter. Because of their liking for unwholesome breeding places, they spread germs and filth in alarming measure. But flies can be reduced substantially by good "policing." Cleaning up all refuse promptly and burning or burying it eliminates the most common source of fly infestation. Rubbish piles, garbage, and dumps should be covered up. It is particularly important to keep the area clean around refreshment stands and food storages.

It would also be worthwhile to insist on control of any fly-producer like a dump within several blocks of an outdoor theatre, and by all means, explore the immediate vicinity for small "sneak" breeding spots.



HERE IS HOW ONE treatment with "Televar" Weed Killer cleaned up weeds and grass along a fence, similar to those found in drive-ins. *(Photograph courtesy Glenn County, California.)*

Mosquitoes Need Water

As for mosquitoes, it is well known that they lay their eggs where moisture conditions are most likely to be favorable for development of later stages in the life cycle. There is a period of a week or so in their lives, when mosquitoes cannot live without water. For this reason, elimination of standing water has long been stressed as one of the most important measures in mosquito control. Standing water does not necessarily mean acres of swampland. It includes water that may collect in empty tin cans in the trash pile, adjacent stagnant ditches, in puddles throughout the parking area, and in cisterns and rain barrels.

Where standing water cannot be eliminated, some other control measure is necessary. Covering the surface with oil is probably the oldest method of controlling mosquito larvae in water. More recently, DDT, particularly in an oil carrier, has been widely used for water surface applications to destroy larvae and kill adult mosquitoes as they emerge.

In Dallas, Texas, the City Health Department has had good results in controlling mosquito larvae with an emulsion concentrate containing 24 per cent methoxychlor—one pint in five gallons of water. The same formulation also has given good kill among flies that were known to be resistant to DDT.

The U. S. Department of Agriculture has also reported that a long-lasting DDT spray, applied to trees, bushes, and grass in an outdoor area will cut down the number of mosquitoes during daylight hours for several weeks, while quick-killing pyrethrum or allethrin "space" sprays will control the pests during early evening when they are continuously flying.



Drive-In Buildings

For refreshment stands and other buildings on the theatre grounds, screens on doors and windows are the most practical way to keep insects out. But they will not do the whole job. That's where chemical sprays help. For indoor spraying, a powder formulation of methoxychlor is one of the safest residual insecticides for fly control. (It is available in two formulations—a 50 per cent wettable powder and a 24 per cent emulsifiable oil.) Use three to four pounds of the wettable powder in 10 gallons of water.

Fogging machines, vaporizers and other high-speed insecticide applicator units are specialized machinery, and should be set up and operated by experts. Chemicals for this type of equipment should be selected on the basis of safety to your employees and your audiences, as well as on their effectiveness against insects.

If the grounds are put in good shape at the beginning of the season, and good sanitation practices are carried out throughout the season, you can usually count on "chemical fly swatters" to do their part of the job.

A DUMP NEAR your drive-in theatre, or on the grounds, may be a constant source of fly and mosquito infestation, and should be cleaned out.

Swimming Pools for Outdoor Theatres

Complete Information On Swimming Pool Construction, and How It Might Apply to the Community-Center Type of Drive-In Operation

BRIEF: ***One of the most recent . . . and significant . . . developments in years . . . has been the change in the character and purpose of the drive-in theatre . . . Where once the outdoor theatre was considered just that . . . a motion picture house without a roof . . . more and more services and facilities have been added . . . until today many outdoor theatres have taken on the functions and appearance of community centers . . . It is not uncommon to find a drive-in opening early on a weekend so that patrons may come and spend the entire day . . . with the youngsters enjoying the playground facilities . . . while the adults enjoy the fully equipped concession buildings . . . and sun themselves in attractive patios . . . This not only increases concession revenue . . . but builds good will . . . and helps to make going to the drive-in a regular habit.***

One of the latest innovations being introduced in outdoor theatres . . . is swimming pools . . . Although it represents a major investment . . . it can be a valuable source of revenue . . . and good will . . . if it is properly constructed and operated . . . This article . . . written by one of the leading experts on swimming pool construction in this country . . . gives a complete summary of just what is entailed in the building of a pool . . . Information on types of pools . . . construction problems . . . board of health regulations . . . costs . . . etc . . . is given . . . and should furnish any theatre operator who has been thinking of such a move . . . with all the essential facts about swimming pools for outdoor theatres.

By WESLEY BINTZ
Consulting Civil Engineer

(Copyrighted 1954)

The history of swimming pools goes back thousands of years, in fact, back to the time of Christ. The swimming pools or Baths as they were called were the clubs of that day. They were beautifully built, all tiled in ceramics, columned, lobbied, spacious dressing quarters, and with slaves in any number to take care of the patrons' wants. Excavations that have been made show that these baths were about as nice as anything could be today and up-to-the-minute in every respect; of course lacking only the sanitary arrangements and facilities which are required in baths of today.

From then on the development of the swimming pool has been continual in that new types of construction have been used and new equipment has been added. The biggest changes have come in the matter of sanitation where the rate of turn-over is changed from 24 hours to 16 hours to 8 hours, and now some States require a six-hour turn-over. At the present time, most States require that the water in the swimming pool must be of the drinking water standard and clear enough so that a four-inch disc can be seen in 9 or 11 feet of water clearly.

Swimming is the outstanding active or participating sport as compared to spectator sports, and doesn't even have a close second. In spectator sports such as football—22 people play, tennis—2 or 4 people play, and in golf—4 people per hole play, there is a very passive or spectator audience which a great many times runs into thousands of people per player, and their only interest is in watching the game or noting the outcome. But this is not true in swimming. Except where aquatic meets are held, which are not too common (there may be one or two a year in a pool) we find that the public takes an active part in the use of a swimming pool. And remember, swimming is the one sport that uses all muscles of the body. In fact, we find that on good swimming weather about two per cent of the population is apt to use the pool at any one time, and with a turnover of three and one-half times that in one day, we figure that the capacity of the pool must be such as to take care of seven per cent of the population during any one good swimming day. We might even say that on exceptionally hot days, and when conditions are very favorable, such as a very sunny and warm Sunday, Saturday, or a holiday, this can go up to as much as 10 per cent of the population.

POPULAR SPORT

Now can anyone conceive of a condition where in a town with a population of say 10,000, where we could and would have 1000 swimmers, that there would be 1,000 people to play tennis, or 1,000 people play baseball, of 1,000 people play football, or 1,000 people play golf? It isn't conceivable, and yet that many people could and would use a proper pool during the day. In fact, if about a hundred people, 10 per cent of the above



SWIMMING POOLS, such as this one constructed by the author, can add revenue to the drive-in.

AN OVOID SHAPED pool at the Oak Hill Country Club, which might be adapted for the drive-in.



possible swimmers, played any of the other games mentioned, you'd figure you'd had a pretty good crowd in those sports. And so, we find that swimming is the most active participating sport in the United States.

Since this is an article about pools for outdoor theatres, you might say that theatres have more people, and that's true, but that's a rather passive sport in which you watch the actor or player on the screen or on the stage do the work. He's the fellow that's doing the job and he is being watched. So, it's a sport or pastime, something like baseball or football, which has crowds to watch the sport.

TYPES OF POOLS

Now, we have all types and kinds of swimming pools and let's see if we can evaluate a few that are along that line. Divisions may be made along many lines. And so, first, divide them into indoor pools and outdoors pools.

The Indoor Pool

The indoor pool is very seldom built by itself and used strictly as just a pool. It is normally built in connection with the YMCA, the YWCA, gymnasiums, colleges, high schools and the like, and, thereby, its greatest use is along the lines of what we call controlled bathing. By that we mean that there are classes, and you go bathing whether you want to or not. You go bathing for a credit of one kind or another, and the bathing is not of what we call a voluntary or recreational nature, i.e., come when you feel like it and you go when you feel like it.

An instance of building a pool contrary to that policy is brought out by a pool built in Detroit with the idea in mind of using it the year round. The summer usage is up to 23,000 per month, and the winter usage is down to 3,000 per month. This shows the wide range involved and is an indication that the pool is not properly designed for both conditions. Either it is much too large for winter use, or it's much too small for summer use. Any business that has a spread of 1 to 7 between summer and winter certainly is not worked out or properly designed, or a paying proposition.

Outdoor Pools

Now outdoor pools fall in many classifications. We have pools satisfying every condition from the municipal pool or the pool built for profit, to the Country Club pool, camp pool and private pools. And each one takes a different treatment, different studies to satisfy different conditions, which vary all the way from complete equipment for the pool with purification equipment, to a bathhouse 100 per cent equipped with the latest of every kind of equipment, to the private pool which may be nothing more or less than a glorified hole in the ground.

We have in shapes of pools, all kinds of shapes. There is the rectangular, which is probably the shape built 9 times out of 10. This writer has developed an Ovoid shape pool, which we will discuss later, which is very popular when properly explained. There are other shapes of pools, such as, L-shaped, U-shaped, H-shaped, fan-shaped, kidney-shaped and other odd-shapes mostly used in private pools to bring out some particular idea.

In the matter of pool designs, we should probably bring out that any shape other than the rectangular or the Ovoid is purely to meet certain local conditions and is not an economical shape of pool to build. Any pool that has a re-entrant angle means that the pool wall is not getting as much area inside of that wall as you should get and, therefore, you are spending more money for less water area than possible to get. It can be said that the rectangular pool fits into most all situations, but where you don't have a very formal arrangement or formal garden the Ovoid fits into the arrangement just as well and in a great many times better. Since most walks and flower beds are not of a formal nature,

AN EXAMPLE of a larger pool is seen at the Butler Memorial Park. Pool is 65 by 120 feet.





ANOTHER INTERESTING swimming pool is this one in Boise, Idaho. Pool is 60 by 90 feet in size.

the Ovoid fits into the condition as well as the rectangular and many times much better. If we give the rectangular pool an index of 100, we will find that the Ovoid is about 110, whereas the odd shapes mentioned before will be down in the 50's to 90's depending upon the particular shape used.

Let's discuss for a minute pool types. In types of pools today, you could build one which was developed about 30 years ago, known as the "Bintz Pool." This is a combination pool and bathhouse built as one co-ordinated unit. It is 25 per cent to 35 per cent cheaper to build than the conventional two-unit sunken pool and bathhouse of equal size, permanence, details and equipment. It has about a dozen advantages as compared with the conventional sunken pool and bathhouse.

Then we might build a sunken pool and bathhouse which is a conventional type of structure involving the construction of a sunken pool in the ground and building a bathhouse to one side. Or we might build just a little pool and add some type of a rather small, mostly open arrangement building for bathhouse facilities. Then again, if you happen to be on the side of a hill, we could use the Country Club arrangement which is a combination sunken pool and Bintz pool where the uphill side is on the ground and the downhill side has bathhouse facilities under the deck around the pool. This makes for a very economical arrangement.

Bintz Pool

The Bintz Pool has many advantages as well as the terrific savings in cost as noted. For low ground it is almost a must in that the outfall for draining the pool, instead of being down the ground 10 or 11 feet will only be in the ground two or three feet and, therefore, the pool may be drained to some creek or river or sewer into which it might not be able to get into with the sunken pool. Since the pool sets entirely on top of the ground it is out of ground water and frost action and makes for less upkeep costs. It is possible to service all of the fittings that go through the pool wall. The pool is built like an inverted hat, where the pool is in the crown of the hat and the bathhouse under the rim of the hat and the pool wall becomes one side of the bathroom and, therefore, all of the fixtures which go through this wall are immediately available. You will note from the picture that you have no unsightly fence around the pool, which must be placed around a sunken pool, to protect it against unauthorized use. With a sunken pool, being at ground level, surface dirts will be blown into the pool which dirty it up to a great extent not possible with the Bintz pool. Subdrainage, is much simpler in a Bintz Pool because it is up and out of ground water and frost action. The Bintz Pool adapts itself much better to uneven terrain than a sunken pool since it automatically takes care of about eight-foot difference in elevation in the ground.

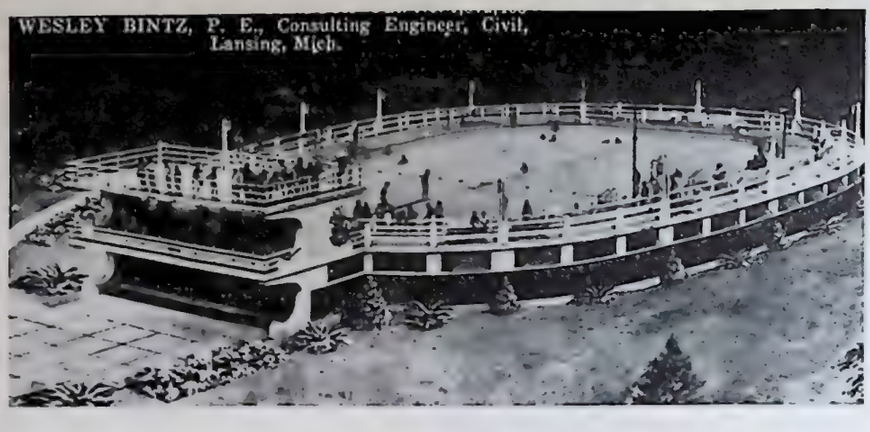
At the present time, a pool designed by the writer is being built in West Virginia and has a difference of 25 feet in ground elevation between one end of the pool and the other, and we are able to do it with this type of pool, which would be quite a problem if you had a sunken pool. The Bintz Pool also uses less ground space by as much as the size of the bathhouse. This is very important if land is at a premium, as it would be at a drive-in.

Ovoid-Shape Pool

Now let's just for a minute discuss further the Ovoid-Shape pool. Ovoid is merely a technical term for egg-shaped which means that one end is larger than the other and that the walls are curved. In this particular shape the ends are squared up so that you can hold aquatic meets the same as in a rectangular pool. This shape of pool is more efficient in every way than the rectangular pool and it is possible to give our client about a 10 per cent larger pool for 10 per cent less money. One of the particular advantages of the Ovoid pool is that it

SMALLER DRIVE-INS might be interested in a pool of the size illustrated in this picture.





ONLY THE largest ozoners would be interested in swimming pools such as the one in Tiffin, O.

allows for a 10 per cent larger area with a 10 per cent shorter wall. As the wall is built on a curve, it is a cheaper wall to build, since it does not require extensive and expensive footings to keep the wall from overturning from water and ground pressures. With this particular shape of pool, there is 25 per cent more wadable water, that is, water from three to five-feet deep, and is, therefore, much more efficient as regards water depths. Ideal conditions for a swimming pool are 85 per cent wadable, three to five-feet deep, and 15 per cent deep water for diving purposes. Obviously that is only possible in large pools because it takes 30 to 40 feet of one end of the pool for the diving pit. So, if you start out with a 60-foot length rectangular pool, and a 30-foot diving area, 50 per cent of the pool area is used for the diving pit which in turn leaves 50 per cent for wadable water. So the Ovoid allows us to approach theoretical standard of 85 per cent wadable water much better and will be about 10 per cent higher than the rectangular pool. Also, this shape pool has the advantage of setting into the landscape a little nicer and adjusts itself to landscaping much better—unless you have very formal arrangements.

Pool Size For Theatres

Let's discuss the size of the pool. We normally figure as we said before that around two per cent of the population will use the pool at any one time and if we assume that there are no other pools in your community, then we should have a pool to carry that number of people. But, where in Municipal pools, we build for the maximm load, which we figure will happen only 6-10 days per summer; in this theatre pool, we build for the medium load, which should happen—maybe—50 per cent of the time and, therefore, we would cut that figure down to about 1.33 per cent of the population for one-time use. Triple that for daily use, i.e., about four per cent. So, in a private venture of this kind, you could plan on the pool being filled to capacity at least 50 per cent of the time, and, therefore, we would use a much smaller pool.

As indicated above, experience has shown that to take care of a certain number of people we have to have a certain size pool. Pools normally are regulated by various systems. But one used more than any other is that there should be one bathhouse facility per every 10 square feet of shallow water from three-foot to five-foot deep, and one bathhouse facility for every 30 square feet of surface for the deep water. Obviously to build a pool and have less bathhouse facilities than the pool will take care of would be poor design.

Using that criterion, and with a population of 10,000 people, we would recommend a pool 50 feet by 75 feet—Ovoid. If it is a town of about 5,000, we would recommend a 40-foot by 60-foot Ovoid pool. For towns of around 15,000, we would recommend a 60 by 90-foot Ovoid pool. For towns of around 25,000 to 30,000, we would recommend an 80-foot by 120-foot Ovoid pool. For towns of 60,000 and up, we would recommend the 100-foot by 165-foot International—50 meter—swimming pool. These sizes are all one size smaller than we would recommend for Municipalities of the population given. The sizes given are for Ovoid shapes.

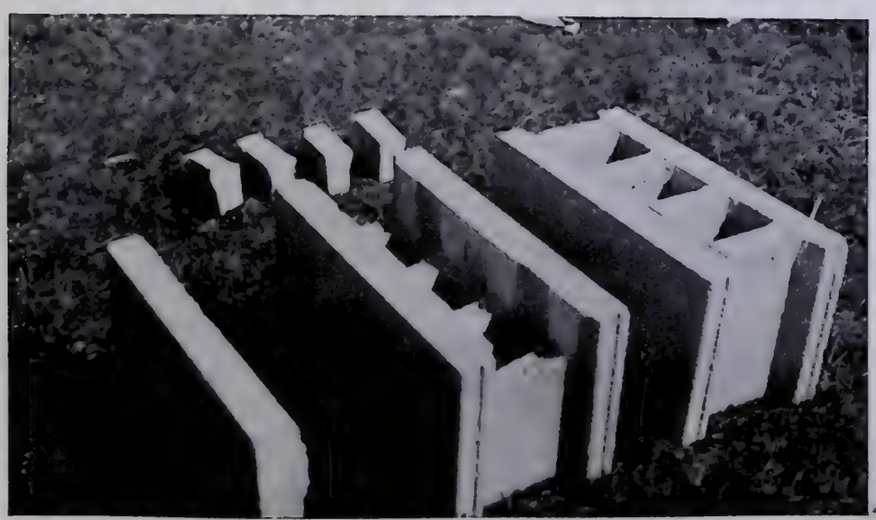
For the rectangular pool, the width should not exceed half the length, preferably even somewhat less; the 165-foot pool should be 75-feet wide, the 120-foot pool, not over 60 feet wide, the 105-foot pool 50-55 feet wide, the 90-foot pool 40-45 feet wide, the 75-foot pool 30-35 feet wide, and the 60-foot pool not over 30 feet wide.

Theatre Pool Equipment

The outdoor theatre pool must have complete pool and bathhouse equipment. Purification equipment comprising filters, sterilizer, pump, motor, chemical pots, etc., must turn over the water in the pool in not more than eight hours. Some States require a six-hour turnover. That is, the water comes in at one end of the pool and goes out the other end in a specialized system of piping at a rate which would re-circulate all of the water in the pool in that number of hours. The water must be sterilized and kept up to a "drinking water standard." In fact, in a great many instances one finds that the water in the swimming pool will test even better than the water you drink as far as bacterial content and clarity is concerned. To the above, the largest single item, must be added the spring boards, ladders, guards-stands, depth signs, swimming lanes, vacuum cleaner, slides—if you like, and other miscellaneous floating equipment which all adds to the use and pleasure of the bathers.

In the bathhouse, of course, you can run the gamut of a bathhouse, which isn't and doesn't do much more than to give you a place to hang a few clothes, provide a place for cleansing showers and a few sanitary facilities, to the complete bathhouse which has a complete sanitary arrangement for both the public and the bathers. Men and women will have locker rooms, dressing stalls for the women, locker benches for the men, vanity shelves, entrance room with counter, restrooms, offices, First Aid Room, and other miscellaneous bather equipment and areas which the owner might want to put in.

A great many times a concession stand for all kinds of candies, drinks and ice-creams and sandwiches are arranged for—although it must be said here that none of this food is allowed around the swimming pool itself. State laws do not allow food of any kind to be used around the swimming pool itself. The bather must leave the swimming pool area to buy this food and must eat or consume this food while away from the pool as it cannot be carried back to the pool.



SEEN HERE (C1) is a concrete block that has been formed so as to make the construction of a swimming pool simpler, and less costly also.





FIGURE C2 (left) shows the block being set up in a wall fully enforced with steel vertically and horizontally in the little channel which you see in this arrangement. Figure C3 (right) shows some precast concrete pieces which go in wall. Toward back are depth sign blocks which are needed.

An accompanying table gives the size pool, area, length pool wall, (costs are proportional to length of pool wall), the size community it will take care of and the probable costs of these pools running the range of absolute minimum that you can get by with to a more or less maximum cost of building it up to a very high standard. Also, noted is probable operating and maintenance costs.

Professional Service Important

Now we might mention some details just to show you how the proper type of professional service is not only invaluable, but must be used in designing your pool, and which will give you an insight into a great many of the things that must be taken care of. For instance, let's take a 60-foot by 90-foot Ovoid pool with an area of 4434 square feet. It has a volume of 173,500 gallons. With water weighing about 8.33 pounds per gallon, we have a total weight of around 725 tons of water which must be maintained in a tank which doesn't leak. A very simple statement but containing two things hard to obtain: A proper pool wall design, and a "pool that doesn't leak." Now frost ensues in cold climates and really does more damage during the nine months of the year when you don't use the pool than during the three-month period when you do use it, so you've got to design so that frost-action doesn't start breaking up the structure. Then there is the complicated matter of proper piping to take the water to the pool and from the pool through the filter. Proper routing of patrons is paramountly important. And all of the other arrangements and facilities which must be worked out to make such a structure pass State Board of Health requirements require skilled engineering services for proper design. Details make a proper swimming pool, but a swimming pool is no detail!

THIS TABLE gives much valuable information about pool size, costs, operation and maintenance.

It might be said here, that a swimming pool is about 20 per cent mechanical, about five per cent electrical, about 10 per cent architectural, about 15 per cent miscellaneous equipment, and about 50 per cent civil and structural. So the pool design is best taken care of by engineering service in the civil or structural category, since that's the type of structure it is. It is not an architectural structure as so many think, but an engineering structure, comparable to a water works or sewage disposal plant.

A little insight into the enormous amount of detailing required to build such a pool should impress the above thought on the reader. So we're going to take one type of construction and give a few details on just what is involved. We have developed a type of construction, using concrete block. We start out with figure C1 showing a concrete block which has been scored on the

Size - Ovoid	40x60	50x75	60x90	70x105	80x120	100x165
Area, SqFt	2096	3062	4435	6065	8157	13516
Length Wall, Feet	169	207	248	290	338	443
Capacity bathers, 1-time	156	246	356	515	680	1215
Size - Rectangular	30x60	35x75	45x90	50x105	60x120	75x165
Area, SqFt	1778	2603	4045	5245	7178	12354
Length Wall, Feet	180	220	270	310	360	480
Capacity bathers, 1-time	118	191	315	406	560	1035
For Community Size, People	6000	9000	13000	20,000	30,000	50,000
Cost - Minimum*	$50,000	$60,000	$75,000	$90,000	$110,000	$160,000
- Maximum*	$65,000	$80,000	100,000	130,000	175,000	250,000

* For Ovoid Pools. For Rectangular Pool costs, add 10% to above cost figures.

For Ovoid Pools of sizes given, with bathhouse about one-third as large as would be used above, and using absolute minimum construction and equipment conditions, thruout, BUT using good Engineering, filters, For sunken pool and bathhouse cost would be about: $30,000 $40,000 $50,000 $60,000 $75,000 $110,000

BUT, these pools will not be of equal size (Except pool size and filters) permanence, details and equipment.

Operation/Year in $ **	$2,500	$3,000	$3,500	$4,000	$5,000	$6,500
Maintenance/Year in $ **	$750	$1,000	$1,250	$1,500	$1,750	$2,000

** Does not include Taxes, depreciation or Amortization.



FIGURE C-4 shows the wall entirely built up. A steel mesh and one inch of concrete is applied.

crosswall and then two inches of the top of the center crosswall knocked out, giving you a two-inch channel in the block. The full block is scored as shown on the right of the illustration, the crosswall knocked out is shown in the center view. On the left is shown a two-inch thick concrete block which is used under special cases. Figure C2 shows this block being set up in a wall, fully enforced with steel vertically and horizontally in the little channel which you see in this arrangement. This particular picture also shows the end cross wall in the Ovoid pool which gives you the specific length of pool required and squares up the ends for acquatic meets. Figure C3 shows some precast concrete pieces which go into the wall. Toward the back are the Depth Sign blocks which are put on the deck around the pool and on the side of which is printed the depth of the pool. In the foreground and to the left there is a block which takes the place of one of the concrete blocks, but on which there is an extension which forms a step which you will see in a later picture. This same block is shown upside down to the right of the picture and shows the scoring at the edge of the wall and the hole through the block for the steel to pass through it. Figure C4, shows the wall entirely built up. On the face of the wall is laid a steel mesh, which is held against the main wall with wires which have been cast in the wall when it was laid up. Then onto the wall is placed a one inch surface of concrete for a facing. And finally figure C5 shows the completed wall with the step and handhold, and also shows an underwater light where such a light might be used.

Now we might say that the particular ladder in this illustration, made up in this fashion, will cost about $10. To buy a ladder to put into the pool would cost, today, about $38. Now that is just one example of how proper professional service will pay for itself many times over in such a structure. Incidentally, this block construction will also save about 70 cents per square foot of wall by eliminating the form work required normally for a poured wall. There are a lot of other details that can't be shown in such an article as this, but the above two items on the wall and the steps indicate just how proper professional service is necessary to anyone who decides to build a swimming pool.

Pool Operation

With the pool built, it must be operated. Cash outlays are required to pay for electric current—power and light for the pool, sterilizing agents—to keep the pool sterile, laundry supplies—to clean up and sweep around the pool, vacuum cleaner — to clean the pool bottom, and the personnel to operate the pool and the bathhouse. In the table prepared especially for this article the probable operating costs for the several sizes have been set up. These costs are not as high as a great many people think, but are predicated on one-third of a century of pool service by the writer and will cover costs if the pool is operated at maximum efficiency.

Maintenance

In the matter of maintenance, there is much or little depending upon how the structure is built. If the structure is properly built, properly engineered, the pool should have very little service requirements except repainting every two or three years. As far as the bathhouse is concerned, the same thing applies. If it is a cheap little wooden structure, it'll take a lot of paint and maintenance. If it is of a more permanent structure of brick and stone and concrete, then the maintenance again amounts to a very little with the exception of repainting every two or three years. This item is also covered in the accompanying table.

We might add here that the matter of operation and maintenance are two different items. One is the cost of running the pool and servicing the bathers, and the other is keeping the capital investment intact over the years, due to the depreciation that enters into every structure.

The pool and bathhouse, depending upon how it is built and assuming that it is properly built, should have a depreciation figure of about two and one-half per cent per year. The equipment, such as filters, lockers and so forth, should carry a depreciation item of about five per cent a year. In other words, figure the pool with a 40-year life and the equipment with a 20-year life.

State Board of Health

Now a word about the State Board of Health. The plans and specifications for a swimming pool must be approved by the State Board of Health before any swimming pool is built. To start a pool and not get such approval would merely result in being held up until such time as such plans and specifications have been prepared. These plans must be submitted to the State Board of Health before construction starts, and the

board will pass normally on the sanitary requirements of the equipment and arrangements and layouts which have been submitted. Some States go even further and pass on the structural qualifications of the pool, through a Building Department under the State, but most States will not go into that angle. They will merely pass on the sanitary requirements. Plans and specifications must be prepared by a registered professional engineer in order to get State Board of Health approval.

Normally the State Board of Health requires a Purification System that will filter, sterilize and recirculate the water at an eight-hour rate as far as the pool is concerned. In the bathhouse—one urinal and one toilet for every 60 men's dressing facilities, and one toilet and one lavatory and one shower for every 40 men or women otherwise. In other words, with a pool and bathhouse where you have provided 480 bathroom facilities, 240 facilities for men and 240 facilities for women, there would be required on the men's side four urinals, four toilets, six lavatories and six showers, and on the women's side—six toilets, six lavatories and six showers.

Proper Design

The engineering in the design of a pool is of a terrific importance and as given above is the major item in the design of a swimming pool. A swimming pool improperly designed will result in immediate maintenance costs and something that will hound the owner over the years because frost has worked on the pool and broken it up, in one way or another or settlement takes place, and you can't have that in a pool! Improper detailed design might mean that you have to dig up back of your pool to replace certain piping because they haven't been properly supported, etc. It has happened oftener than one might think. There are so many things that can happen that it is essential that the man contemplating the building of a pool should employ proper professional service to do the job for him. The bathhouse should also have not only the proper construction, but also the proper layout; because it is necessary that the bathers be properly routed when dressed and undressed as they pick up the locker facilities, take showers, and proceed in an orderly manner to the pool, etc. Such things as foot baths for the bathers are required in some States and not in others. Some require one fee and some others. So it is essential that before any pool design is carried on by the owner that the engineer knows exactly what the requirements for that State Board of Health are before they proceed with the plans and specifications for a swimming pool.

Costs

Finally, it might be said that there isn't a greater sport in the United States than swimming. It requires a moderately high-priced structure to allow people to satisfy this sport. However, that statement is only true taken in the aggregate. Individually, it is not a true statement. For instance, it requires from $1000 to $2000 to provide a place to pay for a golfer. Tennis courts run about $4000 apiece and the most people who can play on it is four. That means it costs about $1000 to provide a place for a man to play tennis. A swimming pool only costs about $200 to $300 for a place for a man to swim. Of course, the only trouble right here is that you can build one tennis court and in a few years build some more, but with a swimming pool you more or less have to do it all at once. It's very expensive and in a great many ways impossible to build a pool in a certain size and expand it at a later date. It just doesn't work out because the piping that would lead to the pool would be too small and the bathhouse facilities wouldn't be adequate and so many things enter into it that it is not normally feasible to increase pool sizes. So swimming is not an expensive sport, but is one that takes a rather moderate investment to provide for a community.

Admission Charges

In the matter of admission charges: By making a charge of 15 cents to 25 cents in the morning, 25 to 40 cents in the afternoon and 50 cents to $1.00 in the evening, the pool will not only be able to pay all operating and maintenance costs, but will also make a reasonable return on the investment. If the prices are made much higher than those indicated, it will tend to keep people away. Then you defeat the purpose for which the pool was built in one respect, and that is to make money. Of course, built in connection with theatres it has another important function, as it becomes a drawing card for the theatre. Pools are not generally good paying investments as far as they themselves are concerned, but they are the greatest drawing card one can have to draw people to enjoy the other facilities. It is conceded that Country Club pools double and triple restaurant and bar income, and the same thing would be true insofar as an outdoor theatre is concerned. It would increase your patronage immensely for the theatre use and the other facilities which have been provided for the use of the customers.

CONCLUSION

In conclusion, we might recapitulate our above thoughts:

1. Swimming Pools provide the most important participating sport there is.

2. Be sure the right size, shape, and cost is determined before starting.

3. State Board of Health Approval must be obtained.

4. Certain minimum requirements are necessary.

5. Competent engineering services are a must—don't start without!

6. Swimming pools in themselves are only moderate income producers, but the by-product of drawing patronage is greater than any other sport.

FIGURE C5 shows the completed wall with the step and handhold, and it also shows an underwater light where such a light might be used. The community center type of drive-in will find that pools pay.



Black Light Pest Control

A New Device Which Uses Black Light and an Electric Grid To Eliminate the Problem of Night-Flying Insects at D-I's

By the very nature of the operation, drive-in theatres are prime targets for all types of night-flying insects and pests. The open area and the many sources of light, such as that found around the concession buildings, the ticket booths, and on the screen, make an outdoor theatre a perfect lure for these annoying insects. Therefore, the matter of pest control is extremely important, since there are very few persons who are willing to share their evening at a drive-in with a moth or a mosquito.

A Possible Solution

A device which may help to end the insect problem at an outdoor theatre is the Insectocutor. The Insectocutor is a unit which consists of an electric grid and a special "black light" tube. The insects are drawn to the unit by the black light, and are instantly killed when they touch the electric grid.

In the past there has been considerable discussion resulting in claims relative to the effectiveness of light traps as a control for night-flying insects. However, it is only with the development of black light, which was accomplished through the cooperation of the General Electric Company, U. S. Department of Agriculture, and the Gardner Manufacturing Company, that a tool was provided, which when used with properly designed traps, can provide a high measure of relief from the troublesome problem of night-flying insects around illuminated areas, such as drive-ins.

BRIEF: ***One of the most important problems involved in the operation of a drive-in theatre is that of pest control . . . It is important . . . both for reasons of health and sanitation . . . and for patron comfort that night-flying insects such as mosquitoes and moths . . . are not allowed to get out of hand . . . This article describes a device which is designed to effectively control pests in the outdoor theatre . . . particularly around the brightly lighted areas such as the concession stand . . . and the ticket booth . . . Through the use of a black light . . . which has the ability to attract insects . . . and draw them away from other light sources . . . there is information dealing with the construction of these units . . . how they operate . . . and how they may be best used for drive-in theatre operation.***

Black Light Background

The name black light is probably not a correct description of this source, for there is only a small part of the visible spectrum omitted by this tube; that is, all of the violet band and less than half of the blue-band. The major portion of the energy released by this tube is in the near ultra-violet, that part of the spectrum between the visible band and the therapeutic band. This part of the ultra violet band does not adversely affect the eye or skin of humans or animals, but apparently creates positive reactions in photo-sensitive insects.

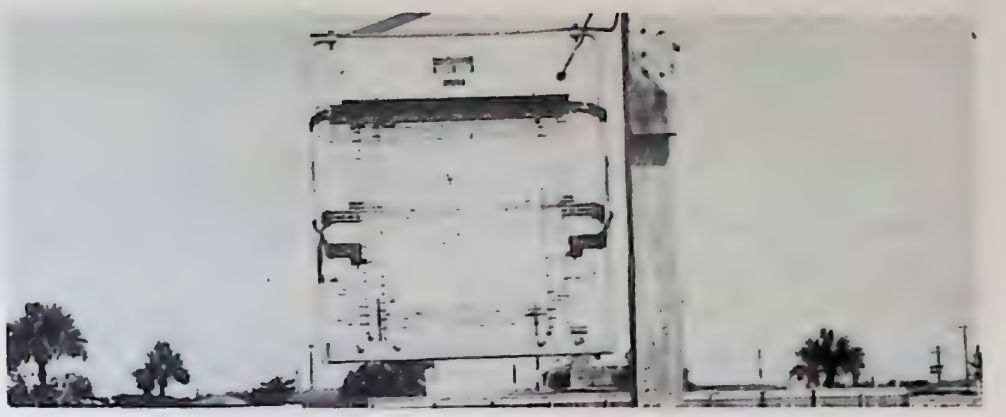
To provide some yardstick to measure the effectiveness of this new energy source over the other energy or light sources as to its attractiveness, the results obtained in work done by the Gardner Manufacturing Company in collaboration with the U. S. Department of Agriculture, at San Benito, Texas, is cited.

Prior to the development of the black light, the most effective light source for attracting insects was the Mercury Vapor Lamp, and in the field work at San Benito, there was a battery of different type traps, and different light sources and wattages, all operating in the same locality. In other words, each trap and light source was exposed to relatively the same insect population. A trap equipped with a 200 watt Mercury Vapor lamp was mounted mid-way between two similar traps equipped with black light tubes, each spaced about 15 feet on each side of the Mercury Vapor light traps. On daily checks on the containers under each trap, it was found that the black light traps would be practically full, and





INSECTOCUTORS may be located near the ticket booth (left) as at the South City, Philadelphia. They are effective at places like the Vic Rice Golf Range, Trenton, with acute insect problems.



PLACING the units in the parking area as at the Hallandale, Hallandale, Fla., is very effective.

only one or two insects in the Mercury Vapor light traps. The wattage of the black light trap was 15 watts in one trap, and 60 watts in the other. Therefore, by this comparison, it can be seen that the black light traps were much more effective.

It is the purpose of the above information to show that black light tubes, even at far less wattage, will draw insects away from other commercial light sources.

It has often been asked how far will these lights attract insects, and what makes them react to the light. Actually, at this time, there is no scientifically accepted answer to either question. It is known that insects marked by dye for identification purposes have been released from as much as three miles from a black light trap, back of a heavy woods through which the black light lamps were not visible to the naked eye; yet, these insects have been taken from the traps the following day. It is also reasonably well established that the influence of light on many insects is so strong that they will invariably break their normal routine and move to the light source as soon as they come into the area where the light is exposed.

Another Test

A further indication of the attraction which black light has for insects can be gotten from the results obtained from a test conducted at Clear Lake, California. The unit used in this test had the black light as the lure, but used a suction fan in place of the electric grid. It has been found that the electric grid, such as the one used on the Insectocutor is even more effective than the suction fan. This fan sucked in all the insects that came near the black light and deposited them into a net that was attached. The following facts were given by the U. S. Department of Agriculture: "Eight-five pounds of Clear Lake gnats attracted by an electric lamp, were caught in a single night in a suction-type trap. Each pound contained about one million insects. House and stable flies attracted to a bait in an electric grid box trap have been destroyed at a rate of 100,000 a day."

Installed in Drive-Ins

A number of Insectocutors have already been installed in outdoor theatres, and the reports on them have been very satisfactory. Charles Goldfine, operator of the South City Drive-In, Philadelphia, Pa., has been using Insectocutors for three seasons, and he reports that, "they have helped considerably to relieve us of our night-flying insect problem. We have found them particularly satisfactory in controlling insects around the snack bar, restrooms and ticket office."

Insectocutors have also been installed in drive-ins in the southern portions of the United States where there is a particularly bad bug problem. This area of the country attracts moths, some of them with wing spreads of as much as four and one-half inches, which fly across the screen during the projection period. To combat this, units are mounted on each side of the screen and slightly back of it, to the side. The insects will then be drawn to the Insectocutor, but they will not fall in front of the screen. The ticket booth area can be cleared of pesty insects by placing Insectocutors slightly away from the booth, thus drawing the bugs away and killing them.

Construction Features

Although the black light tube used in the Insectocutor does give off some visible light, it is so slight that there have been no reports of a complaint by patrons.

An possible danger which might result from a theatre patron accidentally touching the electric grid has been avoided by using a step-up transformer which reduces the current to a maximum of 10 milliamperes, a charge said to be so low that humans and animals cannot be harmed or affected in any way. However, this charge is still strong enough to be deadly to all flying insects on contact.

Another feature of this device which makes its use in drive-ins practical is that it requires no maintenance or supervision. The panels are constructed of high rust-resisting steel, and it is claimed that the transformer and grid will not burn out in high humidity, heavy dew, or a driving rain. This also means that the Insectocutor will work at all times, during any sort of weather. Its construction involves no moving parts, and thus it may render many more seasons of efficient operation than its estimated 20 years of life.

CONCLUSION

The black light tubes in the Insectocutor will draw insects from considerable distances, and a rather small number of units will do an adequate job in a drive-in. They may be mounted on poles, fences, or walls, and should be placed from about eight to 10 feet above the ground. While its effectiveness is not lessened against other insects if placed higher, its effiiciency against the ordinarily low-flying mosquito is lessened with each additional foot in height over 10.

Some of the other advantages claimed for Insectocutors are as follows:

1. Reduces the labor requirements for the control of night-flying insects.
2. Eliminates all, or part of the need for insecticidal mists and fog producing sprays.
3. Eliminates weather hazards which are encountered during the present control methods.
4. Experiments indicate that black light traps are effective during rainy weather when it is difficult to use dusts and sprays.
5. Eliminates or reduces possible harm or injury to individuals in the control of insects.
6. The unit is long-lasting, requires little maintenance, and works only when needed.

The Insectocutors are easy to handle being 24 by 28 inches in size, with a shipping weight of 40 pounds. The black light tubes are estimated to give over 3000 hours of use.



THE HI-WAY, Ft. Lauderdale, Fla., has placed an Insectocutor near the vital snack bar location.

Children Are Your Best Salesmen

The Proper Equipment and Operation of a Playground is a Positive Method of Attracting the Kids and Their Parents to Your Drive-In

BRIEF: *There is probably no more persuasive creature on earth than the child that has seen something that excites its interest and imagination . . . and there is probably no parent alive who can stand up to their arguments for a very long period of time . . . This is a valuable thing for drive-in theatre operators to keep in mind when they are thinking about their playground area . . . By selling the children . . . the outdoor theatre operator has hundreds of eager "salesmen" who will plead with their parents to take them to the drive-in playground . . . As this article points out . . . it is very important therefore that this part of the theatre be given the amount of thought and attention that it deserves.*

This article goes into detail about the various types of equipment that are available to the exhibitor . . . and how this equipment may be put to the best use . . . The importance of showmanship . . . both in the selection of equipment . . . and in the manner in which it is handled . . . is also given attention . . . There is much to be found that will be of value to the drive-in operator who is looking for better ways to improve his theatre . . . and its boxoffice potential.

By Claude Ahrens
President, Miracle Whirl Sales Co.

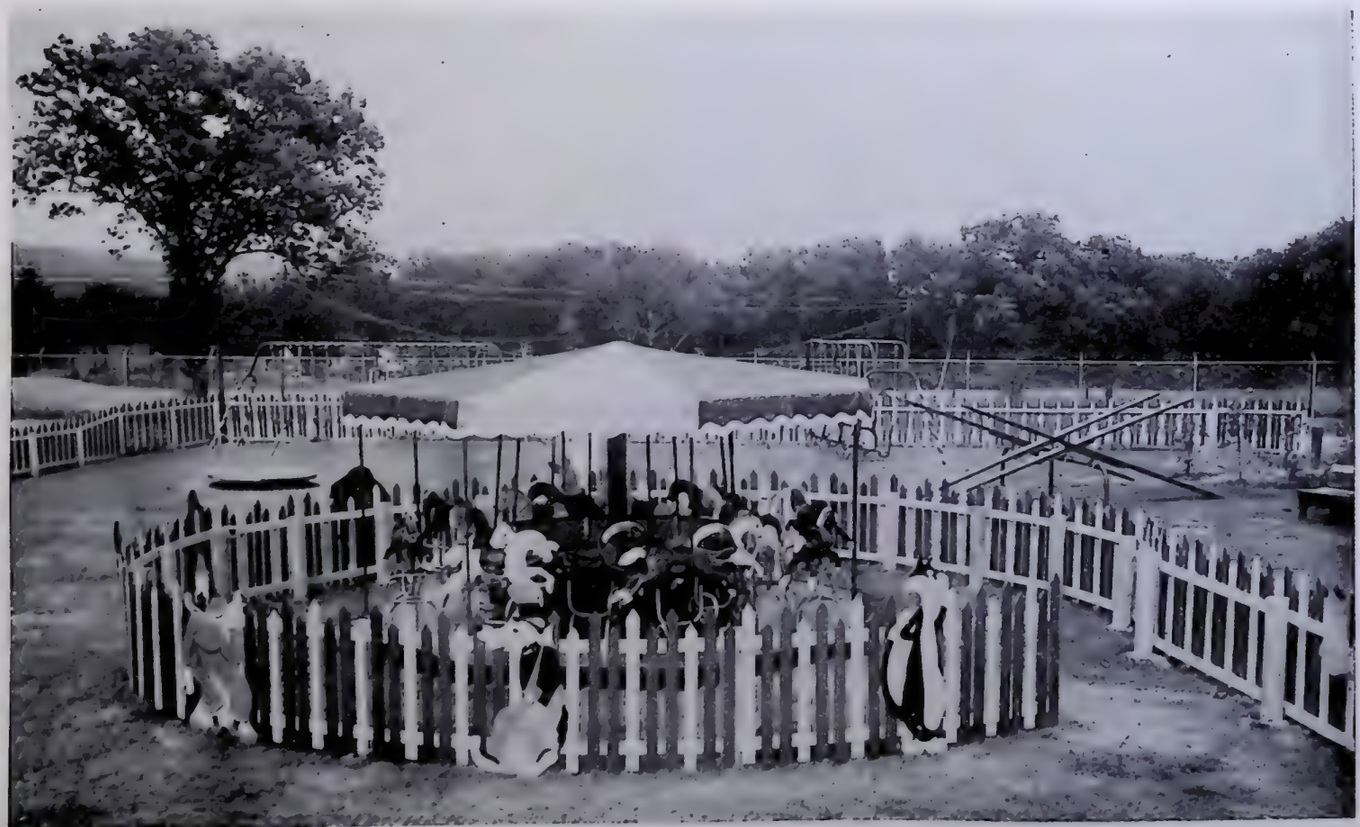
Although the drive-in theatre is a comparatively new form of entertainment in some localities, the novelty is fast wearing off over the nation as a whole. A few years ago very little inducement was needed to bring a capacity crowd most every night. The drive-in theatre was something new, unusual, and different. It was a novel form of entertainment and everybody wanted to experience the thrill of viewing a movie from the comfort of their car. Thus it's easy to understand why even third-rate pictures brought long lines of cars. Today, however, most drive-in theatre managers will agree it takes even more than first-rate pictures to fill their ramps now.

Family Amusement

Yes, the picture has changed considerably. Like everything else, the drive-in theatre has taken its place in the long list of family amusements. This list includes television, which beckons families to remain at home after a long, hard day and be entertained in the comfortable environment of their own living room. This list includes pools, beaches, and public parks which invite families to relax in their pleasant surroundings. This list includes major league, minor league and even little league baseball teams, all urging families to "back the home team." This list includes amusement parks and kiddie-lands which appeal to those families which desire a more active evening's entertainment. Yes, this list covers almost an endless lineup of recreational facilities, all geared to satisfy a family's need for diversion. Competition for the public's entertainment dollar has never been keener . . . and it will be the far-sighted drive-in theatre managers who get their share.

The Ahrens Manufacturing Company, and their exclusive distributor, the Miracle Equipment Company, both of Grinnell, Iowa, are certain the answer to the problem lies with the children of your community. They claim the minute drive-in theatre managers overlook the children, they're overlooking their best salesmen. "Sell the children—they'll sell their parents" . . . that has been the

MIRACLE PONY Ride is the center of attraction at this drive-in. This motor driven ride is available in capacities of 8, 12, or 16. The framework and platforms are all steel and the colorful ponies are made of sturdy cast-iron. The picket fence not only adds to attractiveness, but helps supervise the rides.



basis of many a successful advertising campaign and promotional scheme. Every year millions and millions of dollars are directed primarily to the ears and eyes of children. Such phrases as "Ask mom to . . . ," "Get dad to . . . ," or "Bring your parents in . . ." are commonplace nowadays. Naturally, all this time, effort and money would not be expended in this direction if it were not a profitable approach.

Children Persuasive

The phenomenal success of the kiddieland is a perfect example of the inherent qualities of salesmanship possessed by our children. Even though kiddielands hardly ever appeal directly to the parents, every night they are jammed to capacity. The reason is obvious. Once a child has experienced the thrills of a junior amusement park, he is transformed into a salesman . . . a salesman who works hard and takes his job seriously for he knows he'll enjoy the pleasures of his favorite kiddieland once again only through persistence and diligence.

Now consider the tremendous advantage you have over kiddielands. You not only offer juvenile diversion but also adult entertainment. Naturally, parents are going to put up less sales resistance to their children's pleas if they know they can expect some enjoyment, too. Yes, you can employ every child in your community as your salesman, too. However, he'll work for you only if he gets a good return from his efforts. Put yourself in the shoes of your best salesmen and try to analyze your playground from their viewpoint:

1. Is your equipment safe? Regardless of how much enjoyment your equipment affords, you give your junior salesmen an insurmountable task when you ask them to "sell" their parents on dangerous equipment. Most of the time this will bring an emphatic and final "NO"! and before you realize it, your emissaries decide you've sent them out with a very poor product. What would your reaction be if you were in their place?

Before you purchase any equipment, make sure you check its safety features. Contact other drive-in theatre managers who have bought this same equipment and find out if they ever had any serious accidents. A little research on your part will save you a lot of grief in the end.

Look over your present equipment. Try to imagine what reckless, careless children could think of to make it a safety menace. You must constantly be on the alert for any exposed mechanism, a broken step, a strained part—anything that could cause big tears from small eyes.

Once you and your employees are assured that your equipment is completely safe, then keep it that way. A daily schedule of preventive maintenance is usually all that's required. It doesn't take too much time or effort and it will pay off in big dividends. A squirt of oil here, a new part there, a new coat of paint occasionally—this constant upkeep will help you maintain a spotless safety record.

Remember, your safety factor is the key to a successful playground operation and, ultimately, to a profitable enterprise.

2. Is your playground equipment appealing? Does it possess that indefinable quality known as good showmanship? You cannot expect your pint-size promoters to work for you unless you make it worth their while. Why should they plead with their parents for a night at the drive-in if you don't reward their efforts with an evening filled with fun and laughter? You can correctly assume that almost every child in your playground should get at least some credit for another car in your ramps. Don't you think he deserves a good commission?

Naturally, the number of pieces of equipment in your playground depends upon many factors. However, if you're crowded for space or limited financially, that still does not keep you from displaying good showmanship with the equipment you have on hand or plan to buy. There are swings on the market now which are modern in design and gaily painted like peppermint stick candy. Some of the wooden seats on your present swings can be replaced with safety belts, chairs or even hobby horse units. One or two animal slides might do wonders in enhancing the appearance of your playground. You can buy multicolored merry-go-rounds which are self-propelled and handle an amazing number of children.

Of course, a mechanical ride helps tremendously. Pony rides, chair rides, miniature trains . . . there are many good rides from which to choose. However, make sure you exercise good judgment when you make your selection since a mechanical ride is always the center of attraction. Make sure it's bright and colorful . . . make sure it can be easily supervised . . . make sure it will not require a huge amount of expensive upkeep . . . make sure it has mass appeal.

A colorful picket fence enclosing your playground not only makes it more appealing but also helps parents keep track of their small fry. You can increase this appeal even more by mounting some of these Masonite "fairy-tale" characters on your fencing. Yes, there are countless ways to improve the showmanship of your playground . . . but it depends to a large extent upon the imagination of you and your staff.

Above all, always keep the kids in mind! Try to envision every new idea in their eyes. They are the final judges . . . they are the ones you must please. Are they too demanding? Well, maybe . . . but, after all, they're your best salesmen.

MIRACLE SWING SET (left) is claimed to be the first major improvement in swings for years. The animal slide (right) combines both showmanship and imagination, plus added safety factors.



MIRACLE WHIRL is ideal for children. Painted in bright colors, it holds up to 40 youngsters.



Outdoor Screen Advertising

An Attempt to Better Acquaint the Drive-In Operator With the Subject of Theatre Screen Advertising Films

By PUBLIC RELATIONS DEPT.
Alexander Film Company

The continuing steady growth of the drive-in, both in business and expansion, has launched an entirely new aspect for theatre screen advertising and the drive-in owners. More and more drive-ins are now screening commercial films as part of their regular program.

Income Source

Screen advertising revenue is an income source on which the drive-in operator can definitely bank. He is paid by the film company at a rate determined by the value of the screen to the advertiser based on attendance and by the class of the theatre. The number of ads run by the drive-in during a week's performance is also an important revenue factor.

BRIEF: ***The purpose of this article is to better acquaint the drive-in operator with the steadily growing film advertising medium . . . and how it has an application in the outdoor theatre . . . The article discusses the different types of film advertisements . . . as well as the type of firms that prefer to use the various categories of films . . . There is also an interesting discussion of how the films are distributed . . . and the sort of agreement that is entered by the film salesman and the exhibitor . . . The ability of screen advertising to add to the revenue of a theatre . . . and the tremendous number of people who are reached through this medium . . . are also given thorough treatment.***

One of the most important features of modern theatre screen advertising is the fact that today's commercial films are actually entertaining and informative short subjects, employing Hollywood's finest techniques. Skilled directors with experience are making these commercials attractive and pleasing to the audiences. Professional models, animation, trick effects, and all the setting and background materials used by entertainment film producers, have found their place in commercial film advertising. New models of cars and appliances are effectively and excitingly introduced by film commercials. Food and kitchen product commercials suggest helpful recipes and household hints for today's modern housewife.

Different Categories

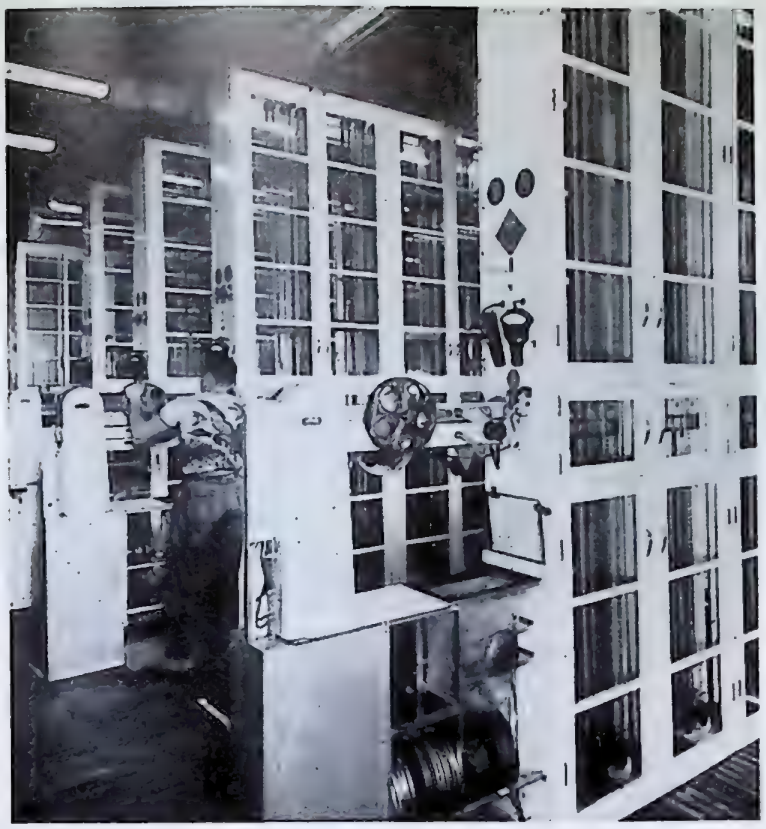
There are several different categories of theatre screen advertising which are offered to the theatre owner by the leading film companies. The most common is the ad for the local business firm in the theatre's community. It may be a drugstore, flower shop, garage, bank, lumber company or any one of some 50 different business lines for which ads are made. The film will be general and will advertise certain benefits to the customer by use of the businessman's product or service. An average ad of this type will run 40 seconds.

Another type of 40-second film is produced specifically for a large manufacturer's dealer organization. One of the largest of these programs handled by the film companies is the Seven-Up Company with dealers all over the United States. Seven-Up makes a series of films each year featuring their famous "Fresh-Up" family theme. Last year over 50,000,000 people saw these films in theatres all across the country. Drive-in and other concessions carrying Seven-Up benefitted too—as an indirect result. The Seven-Up Company has been using film advertising for 17 years and recognizes the value of drive-ins as one of their most important audiences. More than 100 other national advertisers are using the theatre screen medium at the present time with more and more emphasis being put on drive-in advertising.

Still another form of ad which is popular with large manufacturers with mass distribution is the "Minute Movie." This 60-second film is used by a large national advertiser who supplies his product to dealers or retail outlets throughout the country. Chervolet uses these ads on a big scale in the drive-ins. Also typical is Ethyl Corporation's use of the "Minute Movie" on more than 500 drive-in screens in their intensive 1953 ad campaign. Ethyl estimates they reached an audience of 3,350,000 in 1953,



WITH the number of fine drive-ins, such as the Ft. Worth Twin D-I, increasing, advertisers are turning more to outdoor screen advertising.





FIRMS which produce advertising films use all of the facilities of the Hollywood studios. The film in the laboratory (above, left) is going through a drying process. Proper storage and routing of films (above, right) is important and given the proper emphasis. Alexander ships out over 160,000 feet of film a day. Since sound is also important, part of the studio equipment (below) consists of the finest sound facilities available.



and 1954 will mark the fourth consecutive year that Ethyl has used the drive-in campaign with very satisfying results. Other mass distribution "Minute Movie" advertisers are Chiquita Banana and Kellogg's cereals.

Distribution

All film advertising is distributed by the various film companies after a representative has reached an agreement with the theatre on the rate to be paid for each ad unit. Most ads run for one week and all are complete units which are merely spliced right into the theatre's regular entertainment program. The film company agrees to pay the theatre owner a certain amount for each week of screening and ads are sold in conjunction with the theatre's guidance as to ad limit, etc.

A rigid shipping schedule to the theatre is maintained by the film company, and all film units are shipped to the theatre at least one week ahead of the scheduled screening time. Return postage is provided by the film company to facilitate the prompt return of the film after screening. Ease and convenience for the operator is of importance to the film company in assuring the advertiser that his films will be shown as scheduled.

Film advertising is popular with advertisers. The drive-in owner will find that by cementing good relations with the advertisers who are showing ads on his screen he will win many real friends who are in a position to help him by recommending his theatre, pictures that are playing, and in aiding him with promotions.

Trend Growing

The trend toward advertising on the drive-in screen is continually gaining in importance. Recently one of the world largest advertising agencies prepared a special film for use in presenting the idea of drive-in screen advertising to their account executives, who in turn will use it as an effective means of selling the screen advertising medium to the company's clients. Recognition such as this is giving the drive-ins a solid reputation for showing good advertising and will increase the owner's chances in further increasing screen ad revenue.

The Alexander Film Company, which is the world's largest producer and distributor of theatre screen advertising films, has been in the business for

36 years and was among the first to realize the advertising potential of the drive-in. At the present time their clients are increasing their demands for more drive-in space. Alexander has agreements with 2,500 drive-ins and estimate that 10,000,000 people a week see their ads in drive-ins, with the figure increasing weekly.

Reliable Friend

Drive-in men will find that the film advertising salesman from a well established firm is a reliable friend who is sincerely interested in the theatre's welfare. He is ready and willing to help. Most advertising film salesmen have worked in the motion picture business a long time and are highly trained in theatre procedure. At the Alexander Film Company, the salesman is considered an "Ambassador of Goodwill" wherever he goes. He is always telling his prospects about the merits of the theatre in which he sells service.

Advertisers are realizing that the drive-in affords an excellent medium for reaching the family as a group in the privacy of their car. Man and wife, and other family members who are in a position to buy, have an excellent opportunity to discuss the items advertised at the time they see them on the screen. Automobile advertisers, for one, have been quick to realize the point of selling automobiles and automobile equipment to the audience that came to the drive-in in an automobile. Local advertisers realize that most of the people who attend the drive-in are their potential customers.



THE HIGH quality of films produced for theatre screen advertising has steadily increased their acceptance as a regular advertising medium. Studios, such as the one seen (above) have played a major role in bringing about this improvement. The Alexander plant (below) occupies over 18 acres.



Some Reasons Why

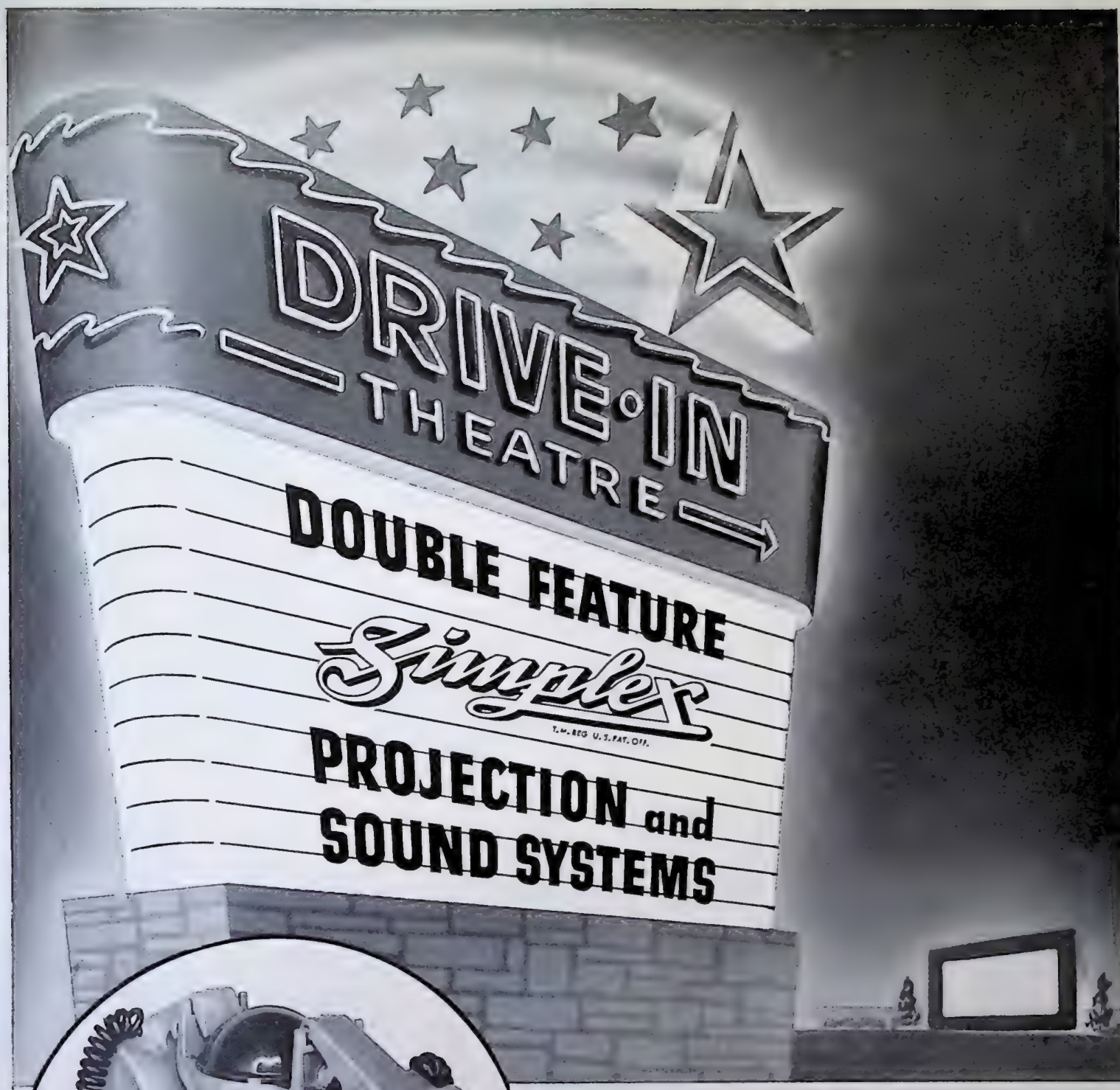
Here are some of the reasons clients give for preferring screen advertising: Low-waste circulation with concentrated reader attention; local, sectional or national coverage . . . excellent farm circulation; product demonstration with full color; action and sound . . . strong sales impact; easy to plan and use with the complete production-distribution service offered by the leading commercial film companies; surprisingly low cost . . . about one-third of a cent per reader-hearer; outstanding quality . . . assured by long production experience plus millions of dollars in production facilities and precision equipment.

CONCLUSION

A drive-in owner can do much to add to his revenue and enhance his entertainment program by showing quality ads from a reliable film company. The film company pays the drive-in for running the service, takes care of the problem of selling space on the screen and collecting from the advertiser. All the theatreman must do is run the film as scheduled by agreement with the film company representative. The drive-in owner will find that theatre screen advertising, pleasingly and originally presented by a reliable company, is now accepted by all audiences. He will find that good advertising will bring favorable comment to his theatre as well as business to the merchants of his community who are having their ads placed on the screen.

Revenue is high with film advertising. Compared with the running time of feature films the average rate paid by the Alexander Film Company runs about four cents per minute higher on film ads than on feature material.

The major film commercial companies have grown right along with the entire movie industry. The latest developments in the field have been incorporated into their production to make them better than ever. Drive-in owners are urged to check the advantages of screen advertising with film commercial company representatives in their areas.





For everything new for your drive-in . . .
. . . the new dimensions . . . the new sound . . . the new speakers . . . make sure of the finest equipment available . . .

Simplex
T.M. REG. U.S. PAT. OFF.

MANUFACTURED BY INTERNATIONAL PROJECTOR CORPORATION • DISTRIBUTED BY NATIONAL THEATRE SUPPLY

SUBSIDIARIES OF GENERAL PRECISION EQUIPMENT CORPORATION

AMERICA'S FINEST DRIVE

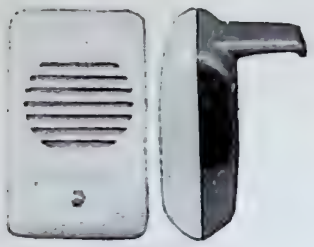
Three Models to Choose from



DELUXE

DELUXE SPEAKER

For those who wish the quality of a 5" unit, this speaker excells in high and low frequency response. The all weather speaker unit is designed to U. S. Signal Corps spec's for longer life. Beautiful 2-toned finish; special volume control shuts off completely; eliminates nuisance hazard. Koiled Kord or straight cord available.



UNIVERSAL
(The Original and Only)

UNIVERSAL SPEAKER

New style Universal offers the following features:

1. Wider speaker opening matches size of unit to prevent obstruction.
2. Venetian type louvres slant downward to decrease sun and water damage.
3. Perforated steel grill for protection of speaker unit from customer damage.
4. Housing redesigned for perfect reproduction and acoustics.
5. Back half of speaker housing and hanger bracket are now cast in one piece.
6. Hanger fits all makes junction boxes.
7. Beautiful 2-tone finish.
8. 4" all weather speaker unit designed to U. S. Signal Corps spec's.
9. Special volume control shuts off completely; eliminates nuisance hazard.
10. Koiled Kord or straight cord available.



AMBASSADOR

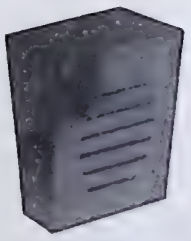
AMBASSADOR SPEAKER

Our Ambassador speaker has been designed for economy and quality reproduction. Has 3½" speaker unit same spec's as Deluxe and Universal speaker models; also same volume control. Beautiful 2 tone finish; Koiled Kord or straight cord available.



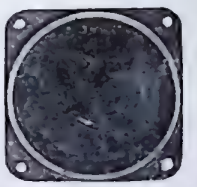
STANDEE SPEAKER

Perfect for playground, patio, concession stand, overflow, back ramp and truck areas. Beautiful 2-tone finish. Preset tamper proof volume control. Built-in matching transformer for 2500 and 7500 ohms.



CONCESSION BUILDING SPEAKER

For inside and outside coverage of concession building, manager's office, booth and restrooms. Has built in volume control, preset by you and tamper proof. Built-in matching transformer 2500 and 7500 ohms. Easily mounted.



REPLACEMENT SPEAKER UNITS

DIT-MCO replacement speaker units are available in all sizes and for all makes of speakers. All DIT-MCO units are all-weather units designed to U. S. Signal Corps spec's and with heavy duty magnets. New units give better satisfaction than repaired speakers. AND ARE CHEAPER IN LONG RUN.



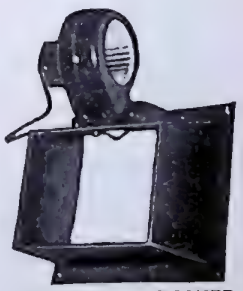
SINGLE STACK ATOMIC JET LAMP HOUSE BLOWER

Made for installation of one at each lamp house; keeps lamps cool and clean; reduces carbon consumption. A must with the new higher amperages. Available for 6" or 8" pipe. Also helps reduce booth heat.



DOUBLE ("T" TYPE) ATOMIC JET LAMP HOUSE BLOWER

Made for both lamps connecting into one blower; has same advantages as single stack. Also available for 6" or 8" pipe.



PORTHOLE BLOWER

Our new style porthole blower was designed for the new wide angle projection. Top of housing slants up 25° so housing may be mounted flush at porthole and projected beam will pass through freely. Fins are installed to assure even distribution of air. DIT-MCO's porthole blowers mean cleaner projection—eliminates dust—rain—bugs and flies from coming in porthole. Keeps expensive lens and equipment clean. Also acts as an auxiliary exhaust.



DIT-MCO SCREEN COATING

Special formula for sharp, brilliant pictures. Tested and proved "America's Finest." Coats surface with pure white; no glare; lasts longer. Pure white because it is compounded with titanium; easily applied.



DIT-MCO 3-D POLARIZING SCREEN COATING

Scientifically developed for pictures needing a reflective surface for more light and for polarizing on 3-D pictures. Excellent results on standard pictures—3-D or CinemaScope. Easily applied—lasts longer—economical.

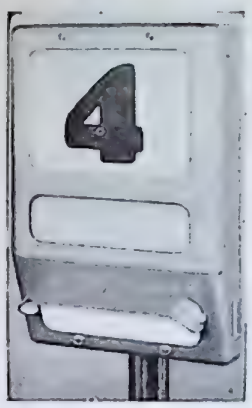
SELENIUM RECTIFIERS

DIT-MCO's DitArc selenium rectifier was designed and is manufactured in our electronics department, to meet the increasing demand for high quality rectifiers in the higher amperages. There are two models available; one for 40 to 100 amperes and the other for 50 to 135 amperes. The rectifiers are equipped with fine and coarse adjustment taps to provide lamp with proper amperage and voltage. All rectifiers are provided with magnetic starters and push button stations. There are no fuses to replace as they are equipped with permanent thermal elements which causes the magnetic solenoid to open the power circuit if overloaded. A built-in time delay is provided for power surges or voltage fluctuation. A thermal switch is also provided for overheating in case of blower failure or clogging of air vents. BUY DIT-MCO AND YOU BUY THE BEST.

DRIVE-IN THEATRE MFG. CO.
(DIV. OF DIT-MCO INCORPORATED)

"World's Largest Manufacturer of Drive-In Theatre Equipment"

-IN THEATRE EQUIPMENT



RAMP LIGHT

America's finest ramp light. The one and only original patented ramp light serving a 3-way purpose — ramp numeral, full sign, and drive-way floodlight. Cut down attendant costs. Speeds up traffic; reduces hazards. Buy DIT-MCO's and you buy the best. Heavy cast aluminum case.



20" LIGHTS SINGLE FACE ONLY

20" DIRECTIONAL LIGHTS

DIT-MCO's 20" directional lights are your traffic guide for entrance, exit, "lights on" "lights off" and many other wordings, with arrows for direction. Speeds up traffic and reduces hazards. Add to your customer's enjoyment. Made of durable aluminum and hammerloid finish to give years of economical service. Single face only.



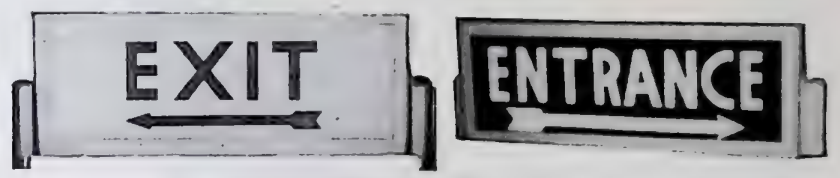
RAMP END EXIT LIGHT

Speeds up emptying of ramps at the break; avoids confusion. Compact, economical, for fence or post mounting at the exit end of each ramp. Exit panels with arrows right or left, or no arrow. Watch your exit traffic smooth out.



REST ROOM LIGHTS

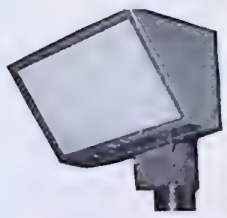
Provide prominent easily seen signs for your rest rooms; avoid confusion. Compact—economical—with downward slant for ease in seeing. A must for every rest room.



40" SINGLE OR DOUBLE FACE

40" DIRECTIONAL LIGHTS

Make it convenient—Make it safe. A must for entrance from the highway. Just the right size so your customers can see them wih ease. Also used at exit to highway to direct incoming traffic out of exit driveway. Exit and Entrance panels with arrows right or left to guide the traffic. Other worded panels and special panels available, for either single or double face 40" lights.



ROADWAY LIGHTS

Developed for the exacting Exhibitor to replace mushroom lights. Compact — attractive —designed to flood your drive-way where it is needed. Now you can control the direction of light. Perfect for use on entrance or exit drive-ways from or to highway. For flush or post mounting.



CONCESSION LIGHT

Get more concession busi-nes. Flush mount a con-cession sign on all sides of your concession building. Light slants down for easy reading. Made of durable aluminum for long wear and low maintenance cost.



ROLL TICKET HOLDER

BOXOFFICE TICKET WINDOW LOCK



PROGRAM SCHEDULE HOLDER



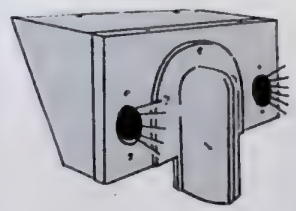
SPEAKING TUBE

BOXOFFICE ITEMS FOR INDOOR AND DRIVE-IN THEATRES

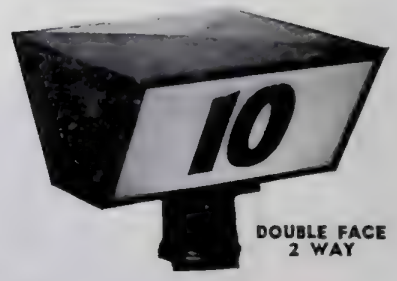
Roll ticket holder — single or double. Plexiglass win-dow lock for change mak-ing space. A must for every boxoffice. Makes opening in boxoffice tam-per proof during closed hours. Cashier can use to keep cold air out during show. Easy to use and economical. Plastic speak-ing tube. Program time schedule holder.



REGULAR



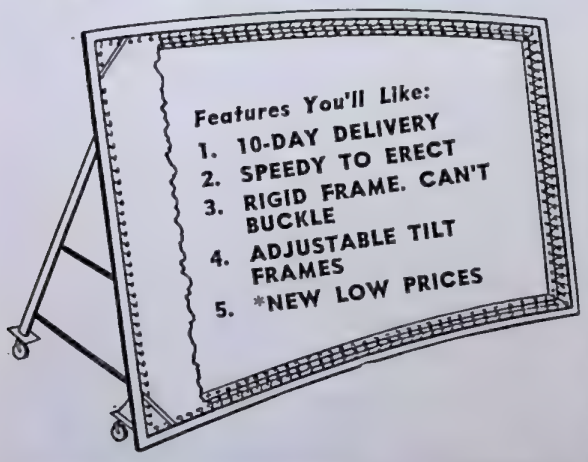
DELUXE



DOUBLE FACE 2 WAY

CENTER AISLE LIGHTS

Three models to choose from. Regular—Deluxe and Two-Way Double Face. The deluxe is same as regular except for two reflective red buttons on rear side to warn patrons. Two-way aisle light has aisle number on both sides so customers may find proper ramp from either direction; make it easier for your customers to find their cars—increase concession sales—compact, economical, made of durable aluminum for long life and low cost.



PERMA-CURVE WIDE CURVED SCREEN FRAME (FOR INDOOR THEATRES)

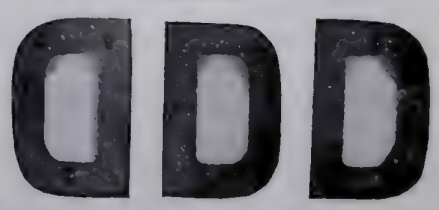
Built-in permanent arc — permanent or adjustable tilt. Available for any size stage. Special types may be designed for your indi-vidual requirements. Quickly and economically installed. Erection plans furnished. Painted flat back — with or without casters. No job too large or too small. The finest engineered frame on the market; designed by top theatre engineers to fit any aspect ratio — any curve, any tilt, can be made to mount in front of pro-scenium arch. Will not buckle. Be safe with the best.



DIT-MCO ALL STEEL WIDE SCREEN TOWERS AND TOWER EXTENSIONS

DIT-MCO towers offer beauty—strength—safety — economy. Designed for 30 lb. per sq. ft. wind load or approx. 90 mph wind plus ample safety factor. We manufacture towers to your requirements; any size, any ratio, flat or curved, tilted or vertical. We fabricate to your exact specifications and deliver in 5 to 6 weeks.

Extend your present tower for wide pictures by adding DIT-MCO steel extensions. Just send us your original foundation and erection plans and tell us what you want. We will design new foundations and proper extensions. We can de-sign steel extensions for existing towers whether they be of steel, wood or masonry.



DIT-MCO EASY-CHANGE MARQUEE LETTERS

Easy to read—easy to change—available in black or colors. Weatherproof; won't warp or buckle; equipped with snap or rigid clips. Aluminum track for installation on any type of sign. All letters have cove edges. Sell your shows with easy to read DIT-MCO easy-change marquee let-ters. Made of one-quarter inch tempered masonite.

505 W. 9th STREET
KANSAS CITY 5, MO.

HArrison 8007-8484

OTHER WELL KNOWN AND WIDELY USED DIT-MCO PRODUCTS

NEO-SEAL BURIAL WIRE—ALUMINUM AND WOOD SAFETY LADDERS—ROTARY POWER MOWERS—DRAG BROOMS—PLAYGROUND EQUIPMENT—3-D FILTER ALIGNMENT AND COOLING MECHANISM.

The Industry's Lowest Prices on Quality Equipment!

First·American sells FACTORY-TO-YOU!

F-O-R I-N-D-O-O-R T-H-E-A-T-R-E-S:



TODAY'S GREATEST VALUE IN WALL-MOUNTING SPEAKERS!

AUDITORIUM SIDE-WALL SPEAKERS for STEREOPHONIC SOUND

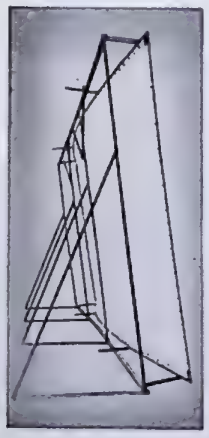
Here is the speaker that is superbly engineered for Stereophonic Sound by the industry's foremost sound experts. Designed to give you the very finest quality for a price much lower than you would expect to pay! This 12" Duplex Speaker has extended range, with a frequency response of from 40 to over 12,000 cps. It is equipped with an Alnico V 10-ounce magnet, and comes complete with line-to-voice-coil matching transformer which will couple to any theatre sound system. Cabinet is 16" x 16" x 8½", and is acoustically designed and treated to reproduce the finest tonal qualities. Neutral gray finish. List $29.95, less 10% for cash, only..... **$26.33**

(Special Colors Slightly Higher)



PORT HOLE BLOWER

A MUST for every projection room! Prevents dust, rain and insects from entering port hole, eliminates need for port hole glass, and acts as auxiliary exhaust. Mounts flush at port hole and allows wide angle beam to pass through freely. List $21.95, less 10% for cash, only..... **$19.76**



ADJUST-A-CURVE SCREEN FRAMES

Adjust-A-Curve is the wide-arc screen frame that gives you the exact curvature setting you want at all points across the entire arc —quickly, easily, accurately—and the setting is held securely until you wish to change it. Stands solidly on the floor, but permits the separate frame which holds the screen to be tilted at will to any desired angle. May also be used flat. Prices start at $239.50 List, less 10% for cash, only..... **$215.55**

DRIVE-IN THEATRE SCREEN PAINTS

and 3-D SCREEN PAINT for INDOOR OR OUTDOOR USE



First-American's Screen Paints are praised by every exhibitor who has tried them. Superior optical qualities, the result of laboratory research and exhaustive testing in actual service. Formulated to specification by one of America's foremost paint producers.

OUTDOOR WHITE, $4.25 gal. list. Less 10% for cash = $3.82. 5-gal. $19.75 list. Less 10% = $17.78. 3-D for indoor or outdoor screens, gal. $4.75 list. Less 10% = $4.28. 5-gal. $22.00 list. Less 10% = $19.80.

Write for COMPLETE CATALOG and PRICES ...and get this Valuable Portfolio FREE



9 Expandable Pockets Cover All Theatre Operation & Equipment Subjects. $1.50 Value

Enables you to keep clippings, equipment literature and other theatre-operating information neatly filed for ready reference, in easy-to-find logical order. Fits correspondence drawer file or stands on shelf. Any theatre owner, manager or circuit executive may have this useful portfolio just for the asking!

Also Full Line of DRIVE-IN PAINTS, Masking and Curb and Pavement Marking Paints

First·American

First·American

Deal Direct and SAVE!
Look at these UNHEARD-OF VALUES!

MONEY-BACK GUARANTEE!

F-O-R D-R-I-V-E I-N T-H-E-A-T-R-E-S:



"THE CHIEF" IN-CAR SPEAKER

Absolutely nothing finer in tone quality, appearance, component materials and workmanship . . . and with exclusive features that make it a stand-out over others at far higher prices! Beautifully-finished cast aluminum housings, with superior volume control and many other advantages. Get the full specifications and compare. ORDER ONE! See It . . . Try It! It will prove its superior value to you! Single 3½" speaker with straight cord, $4.95 List, less 10% for cash with order..... **$4.46**

(C.O.D.'s are at straight list, $4.95)

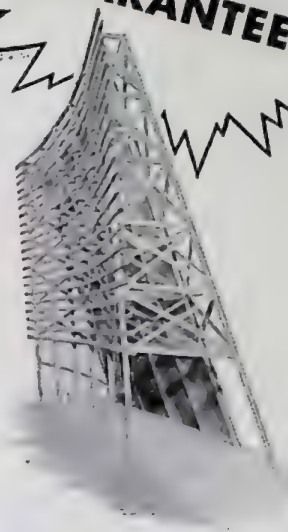
OTHER "CHIEF" 3½" SPEAKERS from $5.36 to $14.90 after discount
SET: Junction Box and 2 speakers, complete with straight cords, list $13.95, less 10% for cash $12.56

"SUPER CHIEF" 4" SPEAKERS from $6.26 to $16.70 after discount
SET: Junction Box and 2 speakers, complete with straight cords, list $15.95, less 10% for cash $14.36

"DUO-SEAL" BURIAL WIRE FOR SPEAKERS

Duo-Seal's super-insulation minimizes transmission loss, protects stability for extreme periods of time—even under water—and has high dielectric strength. Built for long service in the ground without wrapping or conduit. In actual use in many installations for 8 years and still going!

Duo-Seal is made of hard drawn copper and jacketed in neoprene of tire-tread quality overall, amply and uniformly thick. This tough, heavy-duty insulation resists cuts, abrasions, oil, grease and acids throughout a long service life. As low as $37.50 per 1,000 ft. List less 10% for cash..... **$33.75**



SCREEN TOWERS & EXTENSIONS

Now you can have a new screen tower, or extend your existing screen tower to accommodate the wider aspect ratios at a cost so relatively small it will amaze you! First-American renders complete service right to your site! Ask us to quote on your requirements!

LIGHTS AND DIRECTIONAL SIGNS

Win happy patrons and bigger business with these better-built signs . . . sizes, styles and wordings for every purpose . . . bigger, more attractive and readable . . . easy-access sliding panels and mounting brackets that fit any post without adapters (or wall-mount) plus many other fine features. At such low prices, you can speed up your traffic and get more refreshment sales:



A. 24" single-face illuminated sign. Choice of wording. List $16.95, less 10% for cash . . Only..... **$15.95**

B. Ramp identification sign, 8" x 7" each face. Any numerals or letters plus independently lighted FULL panel, List $13.95, less 10% for cash . . Only **$12.56**

C. Sign for wall mounting. Complete with glass panel, choice of wordings. List $5.95, less 10% for cash . . . Only **$5.36**

All orders shipped immediately (cheapest way unless you specify otherwise). Shipping charges collect. Space permits only selected values to be shown in this ad. For other great values, WRITE FOR FIRST-AMERICAN CATALOG containing
A Complete Line Of Theatre Equipment, Including These Additional Products:

REPLACEMENT CORDS for speakers
ROADWAY and MARKER LIGHTS
SAFETY LADDERS
CHANGEABLE MARQUEE LETTERS
LAMPHOUSE BLOWERS
DRAG BROOMS
And a Great Line of REFRESHMENT COUNTERS and EQUIPMENT!

Prices subject to change after July 1, 1955.

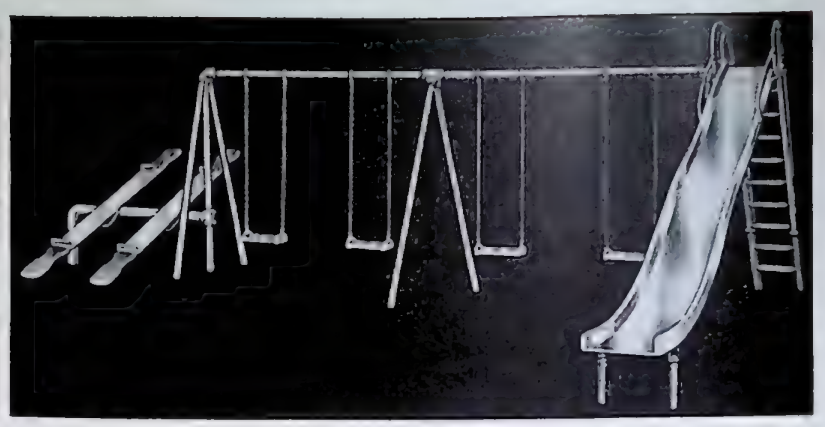
products, inc.

1717 Wyandotte St., Kansas City 8, Mo.
Phone: BAltimore 6882

First-American



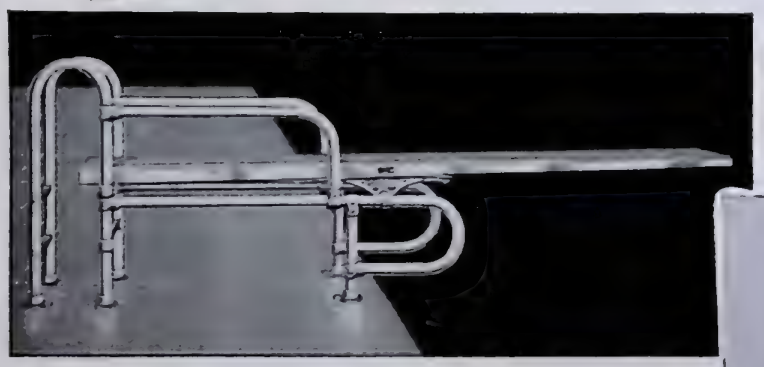
American Streamlined Heavy Duty Picnic Table



An American De Luxe Slide Combination Unit

Unsurpassed IN DESIGN, PERFORMANCE AND SAFETY





Above—New All-American Picnic Grill

Below—An American Official Regulation One-Meter Diving Unit

It's the *plus* factor that makes American the most respected name in Playground Equipment. First, plus in *design*. Never content to copy, American engineers have pioneered scores of design improvements and innovations. Next, plus in *performance*. Employing superior materials, master craftsmanship and improved production methods, American Approved Equipment is built to endure. Finally, plus in *safely*. American craftsmen are aware of their responsibility for the safety of your children. Thus, with American you receive a combination of far superior design, unexcelled performance, and unmatched safety.

The *plus* factor extends to our dealings with customers. You will find AMERICAN pleasant to do business with, prompt and equitable in adjustments, eager to protect an enviable reputation nearly half a century old.

AMERICAN
PLAYGROUND DEVICE CO.
ANDERSON, INDIANA
World's Largest Manufacturers of Fine Playground & Swimming Pool Equipment

Write Today FOR CATALOGS AND SPECIAL LITERATURE FEATURING AMERICAN APPROVED

PLAYGROUND EQUIPMENT • • • SWIMMING POOL EQUIPMENT • • • ALL-AMERICAN PICNIC GRILLS
ALL-AMERICAN UNIFORM HANGERS • • • AMERICAN HEAVY DUTY CHECKING AND GYMNASIUM BASKETS
STEEL BASKET RACKS • • • AMERICAN REPAIR EQUIPMENT • • • AMERICAN HOME PLAY EQUIPMENT

Internationally Specified . . . . . Internationally Approved

*Koiled Kords**

HELP DRIVE-IN OPERATORS . . .



by Minimizing Speaker Losses
by Long Lasting Service
by Improved Appearance

Koiled Kords are retractile cords that....

EXTEND up to 8 feet or as little as needed with no slack, drooping, looping wire to catch on and be broken by car projections **and . . .**

RETRACT to a neat 16 inch coil that hangs close to the speaker standard, completely out of the way.

LONG LASTING, tough neoprene jacket withstands sunshine or storm, high or low temperatures without failing.

NEAT APPEARANCE is assured and inspires a feeling of confidence in the public mind that the operator is giving the best in equipment, pictures and service.

SPECIFY KOILED KORDS on all new speakers you buy and decide now that when straight cords need replacing you'll use KOILED KORDS. Your theatre equipment dealer or local electrical distributor can supply you.

© 1954

Koiled Kords
INCORPORATED

Box K, New Haven 14, Conn.

* Trade Mark of Koiled Kords, Inc.

For TOP PERFORMANCE . . .

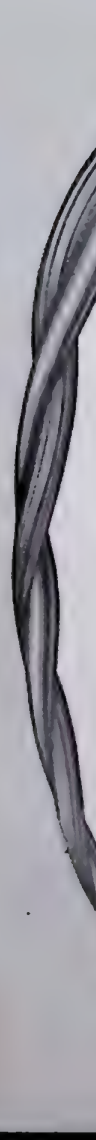
UNDERGROUND

USE

TELESEAL®



Direct Burial Wire
for Drive-in Theatres



TELESEAL gives top performance in drive-in theatres because it is built for the job. This is proved by the fact that millions of feet of TELESEAL are now giving trouble-free service on thousands of *truly economical installations* in all parts of the country.

Admitted, we could make a cheaper wire than TELESEAL and sell miles of it, but it would be more costly to you in the end. Cheaper wire, lacking TELESEAL's rugged neoprene jacket, could, and *does* prove extremely costly, because when it fails, it puts banks of speakers out of commission causing you severe losses. Digging up the old and replacing with new is costly economy.

TELESEAL is dependable, TELESEAL gives long lasting, uninterrupted service under all conditions, for TELESEAL is made specifically for direct burial.

TELESEAL is the most economical underground wire for drive-in speakers. Be sure to specify TELESEAL by name when you order from your theatre supply house or local electrical distributor.

TESMA

WELL-BUILT WIRES SINCE 1899

© 1954

WHITNEY BLAKE COMPANY

NEW HAVEN 14, CONNECTICUT



Looking for a Speaker that is Durable, Efficient and Low Priced?

LOOK NO FURTHER!

Here is the ALL NEW DAWO DRF

$5.45 EACH
WITH STRAIGHT CORD
F.O.B. TOLEDO

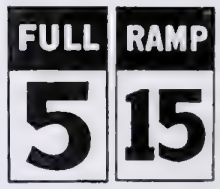
- Full 4" Quam-Nichols Adjust-A-Cone Speaker Units
- Two-Tone Finish—Blue Hammer Back, White Front with Blue Splatter
- Cast Aluminum Cases
- IRC Wire Wound Controls
- Full Sound Range
- Solid Cast Hanger

1 YEAR WARRANTY

THE BEST AND MOST COMPLETE SET OF RAMP AND DIRECTIONAL SIGNS



Dawo Ramp and Directional Signs bring to the theatre a solution to the traffic control problem. With Dawo Ramp Signs, you eliminate wandering customers and the continuous search for parking space. A sign for every need, these modern Drive-In Theatre tested ramp signs are made of sand cast aluminum with a brown hammerloid finish. The size is 14" x 9" x 5", equipped with waterproof light socket and post mounting bracket to fit all size pipe. Dawo Ramp and Directional Signs are made in both vertical and horizontal types, which may be determined by the glass and description below.



★ **D-37**

This Dawo sign located at entering end of ramp, has two lights and manual switch to indicate when ramp is full. All Dawo signs illuminate walkways and driveways.

★ **D-37-A**

A Dawo sign for ramp identification — not complicated — just good. All Dawo signs illuminate walkways and driveways.



D-36-R



D-36-L



D-36-B



D-36-F



D-36-D



D-36-E



D-36-XL



D-36-C



D-36-XR



D-36-G

This Dawo sign can be used to direct your patrons in any direction that you desire them to go. All Dawo signs illuminate walkways and driveways.



Now . . .

REDUCE SPEAKER THEFT

with YOUR NAME cast on each speaker

. . . and DAWO speakers are of highest quality!



What's Your Speaker Problem?

See DAWO

COLOR? SIZE? SPECIAL?
EXPERIMENTAL? ASK US!

QUALITY SPEAKERS by DAWO



D-30

Straight Cords — standard junction box and quality.



D-31

Koiled Kords — standard junction box and quality.



D-32

Straight Cords — junction box with jeweled down lite.



D-33

Koiled Kords — junction box with jeweled down lite.

DAWO Corporation, 145 N. Erie St., Toledo 2, Ohio

ARE YOU OVERLOOKING YOUR BEST SALESMEN?





Miracle PONY RIDE



Lifetime MIRACLE WHIRL



Kiddie ANIMAL SLIDE

These children — and thousands of others just like them in YOUR community — are the best salesmen you could ask for. Yes, every child in your playground certainly deserves a share of the credit for another car in your ramps. All they ask in return for their efforts is an evening filled with fun and laughter.

You can show your pint-sized promotors a good time with a playground designed with their interests in mind. That is where we would like to help you. Every piece of our playground equipment is first of all, safety-tested. Accidents are almost completely eliminated as a result of our careful designing and precise engineering. Secondly, our equipment possesses showmanship . . . it's appealing, it's colorful, it's popular! We are constantly seeking new ways to make our equipment different from the ordinary, the usual, the "expected." Our new Miracle Swing Set, gaily painted like peppermint stick candy, is a good example.

If you have a playground problem, drop us a line today. Like hundreds of other Drive-In Theatre Managers, you'll also discover that Miracle Equipment does not cost . . . IT PAYS!

MIRACLE EQUIPMENT CO.
Box 275 • GRINNELL, IOWA • Phone 929
Exclusive Distributors For Ahrens Mfg. Co., Grinnell, Iowa



Merry CHAIR RIDE

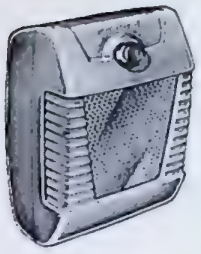


Miracle HOBBY HORSE SWING



Miracle SWING SET

EPRAD MAKES A SPEAKER for EVERY NEED!



EPRAD STAR

An economical speaker which outclasses all competitive models. It has a 3½-inch cone and a Fiberglas case with beautiful molded-in colors. Many of EPRAD Universal's superb qualities are incorporated in this speaker.

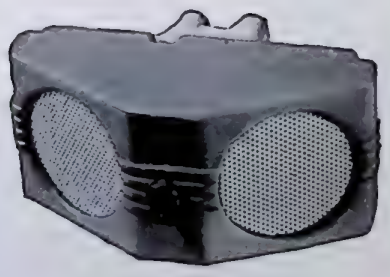


EPRAD UNIVERSAL

The world's most popular replacement speaker. We, along with many operators, feel that it's the best-sounding, most trouble-free, easiest-to-service speaker on the market. It has a Die-Cast Aluminum case and a 4-inch cone. Put a sample speaker in your drive-in and you'll insist on complete replacement with EPRAD UNIVERSALS.

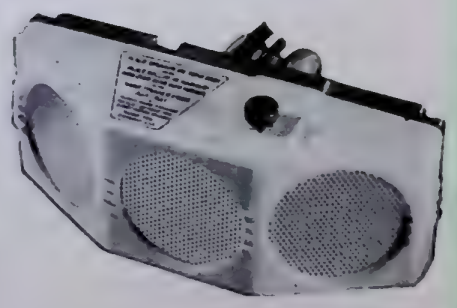
EPRAD 2-WAY

Want to give your patrons economical Stereophonic-sound effects? Then here's the speaker for you. This Fiberglas-cased, 2-way speaker is approximately the size and weight of a standard speaker. It mounts on either the rear-view mirror, top of the dash, ash tray, or window.



EPRAD 3-WAY

Drive-in owners who install this unit claim it gives the finest sound ever heard . . . including standard, optical or Stereophonic. This single, Fiberglas-case, Stereophonic-sound speaker is only slightly larger and heavier than conventional speakers. Sound quality is truly realistic beyond belief because of three, 3½-inch driver units with 1.47-ounce magnets.



CONE-LIFE

A specially developed compound of waxes and silicones, to greatly extend the life of drive-in-theatre speaker cones.

•

EPRAD MOTOR GENERATOR SETS

A-C to D-C motor generator sets especially built for motion picture arc-lamp service.

•

UNI-MAX SCREEN-KOTE

When screens are painted with Uni-Max, you have maximum light dispersion to the extreme sides . . . brilliance of 2-D pictures is increased . . . 3-D showings are permitted without intensifying light source . . . Drive-ins can start earlier.

•

DOWNLITE TRANSFORMERS

•

RAMP SWITCH PANELS

Custom-built or standard for racks or cabinets.

•

DOWNLITE RAMP SWITCH PANELS

Custom-built or standard for racks or cabinets.

•

EPRAD STEREOPHONIC SOUND SYSTEMS

Button-on sound heads
Mixers
Stereo Amplifiers

•

See Your Favorite
INDEPENDENT DEALER

EPRAD

"The Voice of the Drive-In"

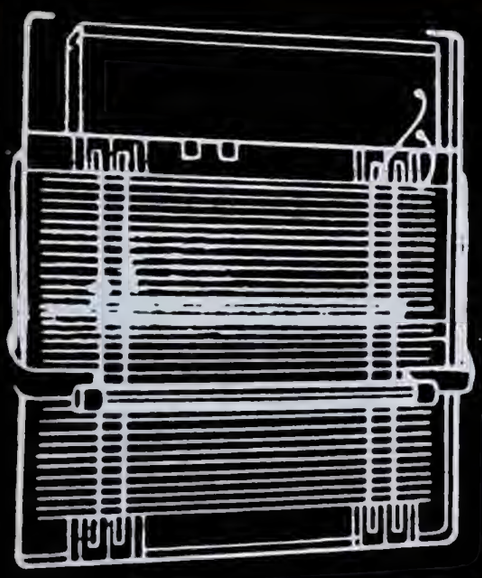
1206 CHERRY—TOLEDO 4, OHIO

"When Better Speakers Are Built, EPRAD Will Build Them"

END DRIVE-IN INSECT PROBLEMS

Futuramic INSECTOCUTORS ELIMINATE *NIGHT-FLYING* INSECTS

AUTOMATICALLY • SAFELY • EFFECTIVELY • ECONOMICALLY



INSECTOCUTOR AG-360

Futuramic Electrified Insectocutors protect outdoor areas from infestation by night-flying insects.

Insectocutors are equipped with two 15 watt black light tubes which will not interfere with the picture on the screen, but *will definitely* draw night-flying insects *from all other sources of light.*

Attempting to reach the light, insects, contact the charged grid and are electrocuted. This is the most practical, effective, and economical method yet offered to control night-flying insects. Insectocutor panels are ruggedly constructed of high rust-resisting steel to deliver many years of service under the hard conditions of outdoor use. The transformer and grid will not burn out in high humidity, heavy dew or even driving rain.

Some of the advantages of the Insectocutors — proven by extensive field research include:

- *Reduces labor requirements.*
- *Reduces cost of insect control.*
- *Eliminates all or part of the need for insecticidal mist and fog producing sprays.*
- *Effective during rainy and windy weather when it is difficult or impossible to use dusts and sprays.*
- *Eliminates or reduces possible harmful and undesirable residue.*

Exceptionally effective for control of night-flying insects around drive-ins where there are particularly bad bug problems around cashier windows, snack bars, and rest rooms.

Saves time, labor, and expense—safely kills insects on contact—no moving parts to wear out.

Only cost after installation is electricity used—works continuously and automatically — requires no attention.

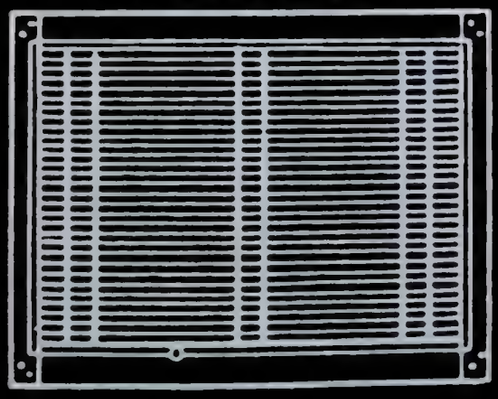
The AG-360 is ideal for the control of night-flying insects in any portion of the drive-in theatre area. It consists of a specially designed electric grid, built-in transformer and two 15 watt black light tubes. The unit is 24 inches wide and 28 inches high — shipping weight 42 pounds.

FT-150—Portable Insectocutor—used inside or outdoors for spot locations where there is a heavy concentration of flies.

FT-175—a ceiling unit for indoor application.

Window and Door INSECTOCUTOR *screens*—effectively prevents insects from entering rooms and buildings.

WINDOW OR DOOR SCREEN



F.T.-150



F.T.-175



FUTURAMIC EQUIPMENT COMPANY

—PRODUCTS OF THE FUTURE—

1927 CHESTNUT STREET, PHILADELPHIA 3, PA.

(Some Theatre Supply Dealerships Available)

BOOK TWO:

Equipment

Front and Lobby

LIGHTING INDOOR AND OUTDOOR THEATRES *George T. Howard* 154
Through Study of Various Types of Reflector and Projector Floodlighting Lamps, and How They May Be Used in a Theatre

THEATRE TURNSTILE SYSTEM..... 162
Theatre Turnstiles Offer an Efficient Admissions System that Will Only Require the Services of a Single Employee

AUTOMATIC DOOR OPENERS.....*Barry Johnson* 164
The Use of an Automatic Door Operator in a Theatre Can Result in an Increase in Patronage, Profits and Safety

WIDE ANGLE SLIDE PROJECTOR.....*J. P. Latil* 167
A Discussion of the Construction Details and Uses for Recently Developed 3000 Watts Slide Projector

CLAY TILE FOR THEATRES.....*Al Frantz* 170
A Review of the Many Uses and Advantages of Clay Material in Construction and Operation of a Motion Picture Theatre

Interior and Auditorium

SUPPORTING AND CONTROLLING WIDE SCREEN CURTAINS.....*Abram Samuels* 180
The Problems Involved in Installation of Curved and Straight Track for Wide Screen Curtains are Given With Their Answers

LOUNGE LUXURY.....*Barclay Adams* 187
Luxurious Lounge Areas are an Important Feature of Today's Modern Motion Picture Theatre Architecture

FOUNTAIN OF YOUTH FOR CARPETS.....*Fred C. Hild* 192
A Description of the Process Which Makes it Possible to Restore the Original Colors to Still Sturdy but Faded Theatre Carpeting

WIDE SCREEN FRAMES.....*C. E. Tompkins* 194
A Look at Some of the Problems Involved in the Use of Curved and Straight Screen Frames With Various Wide Screen Systems

STAINPROOF WALL COVERING.....*John E. Williams* 196
This Wallpaper Resists Stains and Wear, and is Easily Cleaned Making It Ideal for Use in Many Parts of the Theatre Building

HOME BEAUTY TREATMENT FOR THEATRES..... 201
A Look at the Various Uses to Which Plastic Wall Tile May be Put in Theatres, and Installation Instructions

Projection and Sound

INSTALLING CINEMASCOPE 220
Thorough and Detailed Review of Equipment Required, Installation Procedures, Maintenance, and Operating Practices for CinemaScope

THE PARAMOUNT VISTAVISION PROCESS 232
A Detailed Study of the Theatrical and Studio Applications of this Wide Screen Process with the Double-Frame Negative

WIDE SCREEN LIGHT REQUIREMENTS....*Arthur J. Hatch* 238
An Analysis of the Light Requirements Necessary in Order to Project the Various Wide Screen Systems Satisfactorily

BASIC PRINCIPLES OF STEREOPHONIC SOUND *William B. Snow* 241
An Important and Fundamental Study of the Principles of Stereophonic Sound is Offered by A Leading Sound Expert

PERSPECTA STEREOPHONIC SOUND...*Charles J. Bachman* 251
Study of the Basic Principles and the Equipment Required to Obtain Stereophonic Sound from A Single Optical Track

CARBONS FOR THE NEW SYSTEMS *F. P. Holloway, R. M. Bushong, W. W. Lozier* 253
An Analysis of the New Systems' Demand for More Projection Light, and Some of the Carbons Developed to Meet This Demand

PROJECTION ARC LAMP REVIEW..... 256
A Survey of the Latest Advances Made in Projection Arc Lamps Plus Information on Proper Installation, Operation, and Care

MOTION PICTURE SCREEN REVIEW 263
A Survey of the Various Types of Screens Presently Available and the Various Features and Advantages to be Found in Each

ASTROLITE REFLECTION THEORY.....*John L. Curtin* 267
Complete Study of the Theory Behind the Development of the Astrolite Screen, and Its Adaptability to the New Systems

TODAY'S RECTIFIER FOR TOMORROW'S ARC, *M. D. Faige* 273
An Analysis of the Design, Construction and Operation of a Selenium Rectifier Developed with Features for the Future

EFFECTS OF STRAY LIGHT ON PICTURE QUALITY *Raymond L. Estes* 275
A Comprehensive Study of the Influence of Stray Light on the Quality of Indoor and of Drive-In Projected Pictures

SINGLE STRIP 3-D 281
An Examination of Two of the Leading Methods of Obtaining Three-Dimensional Pictures on a Single Strip of 35MM Film

CHANGING SERVICE SCENE.....*Bert Ennis* 285
A Summation of the Advances Made by a Leading Sound Service Organization, and a Review of the Latest Methods Now in Use

THE PICTURE BRIGHTENS.....*Edward Lachman* 289
Summary of the Early Development of One of the Leading Carbons and Its Role in Lighting New Screen Dimensions

A LAMP FOR THE NEW DIMENSIONS.....*J. W. Servies* 291
A Description of the National Excelite Projection Arc Lamps and Its New Design to Meet Demand for More Light

Advertising:

A

ADAM, FRANK, ELECTRIC CO..... 205
ADLER SILHOUETTE LETTER CO..... 176
AMERICAN SEATING CO..... 214
ASHCRAFT, C. S., MANUFACTURING CO., INC..... 306

B

BALLANTYNE CO., THE..... 303
BAUSCH AND LOMB OPTICAL CO..... 310
BEVELITE 173

C

CENTURY PROJECTOR CORP..... 302
CLANCY, J. R., INC..... 209

E

EXCELITE 308

F

FEDERAL PACIFIC ELECTRIC CO..... 208
FUTTER, WALTER 320

H

HERTNER ELECTRIC CO., THE..... 309
HEWITT-ROBINS, INC. (RESTFOAM DIV.)..... 212
HEYWOOD-WAKEFIELD CO. (THEATRE SEATING DIV.)..... 216

I

IDEAL SEATING CO..... 218
INTERNATIONAL PROJECTOR CORP..... 305

K

KNOXVILLE SCENIC STUDIOS, INC..... 211
KOLLMORGEN OPTICAL CORP..... 312

L

LA VEZZI MACHINE WORKS..... 314

M

MAHARAM FABRIC CORP..... 215
MCAULEY, J. E., MANUFACTURING CO..... 207
MOTIOGRAPH, INC.....296, 297

N

NATIONAL CARBON CO..... 319
NATIONAL SUPER SERVICE CO., INC..... 217
NATIONAL THEATRE SUPPLY.....304, 305, 308, 309, 318
NOVELTY SCENIC STUDIOS, INC..... 213

P

PEREY MANUFACTURING CO., INC..... 177

R

RADIANT MANUFACTURING CO..... 316
RADIO CORP. OF AMERICA (RCA THEATRE EQUIPMENT).....298, 299
RAYTONE SCREEN CORP..... 317
RESTFOAM DIV., HEWITT-ROBINS, INC..... 212
ROBIN, J. E., INC.....300, 301

S

STRONG ELECTRIC CORP., THE.....294, 295
SUPERIOR ELECTRIC CO., THE..... 210

T

THEATRE SPECIALTIES, INC..... 173

U

UNION CARBIDE AND CARBON CORP..... 319
UNIVERSAL CORP..... 178

V

VOCALITE SCREEN CORP..... 315

W

WAGNER SIGN SERVICE, INC.....174, 175
WALKER SCREEN CO..... 318
WARD LEONARD ELECTRIC CO.....206, 207
WILLIAMS SCREEN CO..... 313

FRONT *and* LOBBY

1954-55

Lighting Indoor and Outdoor Theatres

Thorough Study of Various Types of Reflector and Projector Floodlighting Lamps, and How They May Be Used In A Theatre

By GEORGE T. HOWARD
Lamp Division, General Electric Co.

BRIEF: *The old adage . . . don't hide your light under a bushel . . . certainly applies to the operator of conventional or drive-in theatres . . . Proper lighting is of vital importance in the normal operation of any theatre.*

This article offers the reader a comprehensive analysis of the complete line of reflector and projector spotlighting and floodlighting units presently available . . . Each type is discussed in terms of its application to a particular area of the theatre . . . There are portions of the article devoted to entrance lighting . . . marquee illumination . . . auditorium lighting . . . lounges . . . etc.

There is information on how proper floodlighting can help to direct traffic into and around the outdoor theatre . . . as well as to place emphasis on the concession buildings and play areas . . . A good deal of attention is given to the use of colored lamps . . . and how they may be best put to use in the motion picture theatre.

Theatres were among the first to use the reflectorized spot and flood lamps after their introduction in 1938. Inside, it was the R-40 spot and flood lamps; to put light on A-boards, vending machines, and other selling areas. Outside, it was the PAR-38 spot and flood lamps; for banners, parking lots, and exits and alleys. During and since the war a number of new types of projector and reflector lamps have been developed. With all of the innovations since 1945, it may be that some theatremen haven't had an opportunity to become acquainted with all of these new lamps. These lamps are all lighting tools which the theatre operator has at his disposal and which can be used to great advantage.

Reflector and projector lamps are self-contained spotlighting and floodlighting units. The principal advantages of these lamps are compactness, convenience, long life, and a protected reflector. When a reflectorized lamp is replaced, its reflector and lens are also automatically replaced. This assures original performance. The 2000-hour average rated life assures low-maintenance costs. While the reflectorized lamps do have definite advantages in many applications, there are some theatre applications where the adjustability of beam size obtained with conventional spotlighting equipment is needed.



REFLECTOR LAMPS may be used to emphasize the posters and other displays, as well as help to give theatre front bright cheerful appearance.

REFLECTOR LAMPS

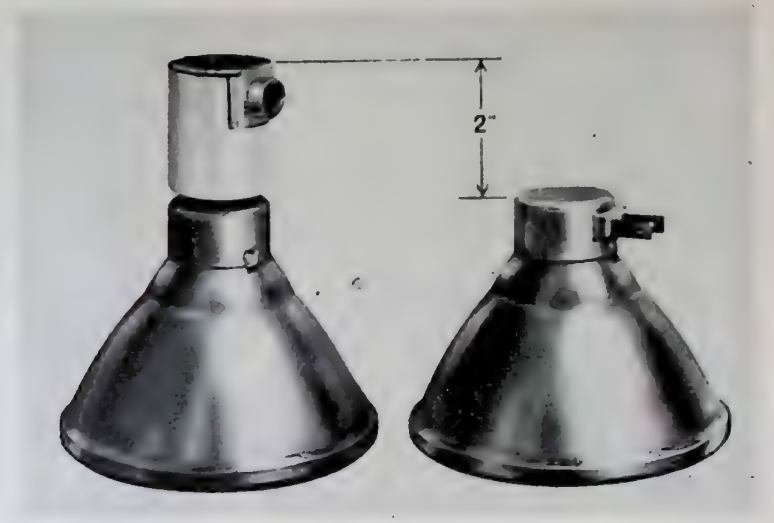
Reflector lamps have bulbs that are formed by blowing the glass into molds. After frosting, a coating of silver is evaporated onto the inside surface of the bulb. The beam pattern depends on the contour of the reflecting silver surface and the density of the frosting applied to the bulb. Spotlight bulbs are frosted lightly, this is the reason that the filament is clearly visible when the lamp is unlighted. The floodlamp bulbs are heavily frosted, making it difficult to see the filament when unlighted. Both the spot and flood lamps provide a soft edge beam of light.

The smallest reflector lamp is the 75-watt R-30. It is available with either spot or flood distribution. The size of this bulb makes it ideal when more light is needed, particularly when the space for the lamp is limited and a larger lamp or larger equipment will not fit. The more familiar 150-watt and 300-watt (R-40) reflector spot and flood lamps are not new, but new uses constantly come to light.

Various Types

In addition to the regular glass reflector lamp, there are also 150, 300, and 500-watt lamps with heat-resistant glass bulbs. These lamps are similar to the regular reflector lamps in physical ap-





A TRIO of popular reflector lamp sizes (left) are the 75, 150, and 300 watt lamps. The PAR 150 watt lamp (right) comes in two convenient sizes. The PAR-38 flood and R-40 spot (below).

pearance and in light distribution. Heat-resistant, blown bulbs are more expensive, however, because of the difficulty in "working" this type of glass in ordinary lamp manufacturing processes. This glass will withstand greater thermal shocks, such as that from moisture on the hot bulb. They will also withstand greater strains which are likely to cause lamp failure when shielding louvers or color accessories are supported directly by the bulb. Reflector lamps are not intended to support accessories. Better practice is to use devices which support color frames, louvers, or other accessories separate from the lamp. These devices are usually fastened to the socket or lamp housing.

The R-52 lamps, in 500 and 750 watts, were especially designed for high-mounting in industrial areas. These lamps have recently become popular, particularly in flat-ceilinged auditoriums, for use as white house lights. The housings for these lamps are flush-mounted in the ceiling and the lamps are used as downlights.

A newer group of reflector lamps which can be very useful in the theatre are the reflector color lamps. These lamps, similar to the conventional reflectorized lamps with a built-in reflector, have a permanent, baked-on color filter. They represent an important advance in the field of colored lighting because their colors form a balanced compatible group. There are six colors available. Four of these — red, yellow, green, and blue — are highly saturated and are considered basic colors. There are also two lighter colors or tints — pink and blue-white. The four basic colors are equally spaced as to hue and will therefore form complimentary pairs. There are harmonious colors: strong, clean, attractive and satisfying. The two tints on the other hand will produce complexion-flattering, warm or cool light.

Color Combinations

A great variety of colors and effects can easily be obtained with combinations of the six colors from the reflector color lamps. Mixtures of two colors can produce useful, intermediate hues. As an example, yellow and red combine to produce amber — red and blue make magenta or purple. When yellow is combined with blue, or blue-white in the



proper proportions, white light is obtained. Two or more colors may easily be used in this manner to produce a third color. But, if two colors are used from opposite directions on a three-dimensional object, as is so often done in the theatre, they will not only combine to produce another color on the object, but they will also cause very interesting shadows behind it. As can be seen, there are untold uses for these reflector color lamps in the theatre.

PROJECTOR LAMPS

Projector lamps are similar in construction to the familiar all-glass Sealed Beam automobile headlamps. The reflector section, of heat-resistant glass, is formed by pressing in an accurate mold. A smooth coating of aluminum is then evaporated onto the inside surface. To the reflector is fused the heat-resistant glass cover plate or lens, likewise formed by pressing in an accurate mold. Aluminum is used as the reflector because it withstands the high temperature required when the lens is fused to the reflector. Beam pattern depends on reflector contour and lens design.

The introduction of the two piece construction idea was indeed revolutionary after over half a century of conventional lamp making methods. The pressed or molded glass construction not only allows more precision in bulb reflector contour and filament positioning, but also permits prefabrication testing of both. The sealed-in reflector and lens combination results in higher efficiency and better control of light than with reflector lamps. The increased light output effiiciency, the higher beam candlepower, and the special beam patterns obtainable from PAR lamps, often more than offset their higher cost as compared to reflector lamps.

Many Advancements Made

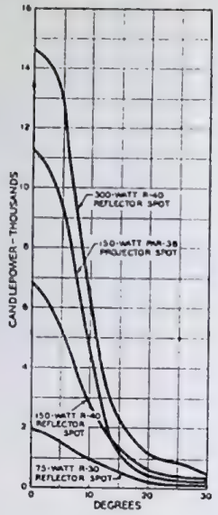
A great many advancements have been made with PAR lamps since the original 150-watt PAR spot and flood lamps. Not the least of these was the introduction of the *compact* PAR-38 lamp. While the lamp itself is only one-inch shorter than the conventional PAR-38, it has a side prong base. This base eliminates the need for the conventional shell type of socket and often reduces the overall length of lamp and socket by as much as two inches. This type of lamp is excellent for a location where a concentrated beam of light is needed, but where the space is not available for the conventional type of reflector or projector lamp. After the side-prong PAR-38 was introduced, the side prong PAR-46 and the end prong PAR-56 lamps were added to complete the line. These lamps are usually supported by their rim (that part of the lamp at which the lens is sealed to the reflector). Most of the equipment available for housing the side and end prong PAR lamps makes use of this fact.

The 200-watt, PAR-46 lamp is available only as a spot lamp. Its concentrated beam provides a lamp with excellent light control. The 300-watt, PAR-56 lamp is not only available with a concentrated spot beam, but also as a flood lamp. This flood lamp is the newest. By means of prisms, built into the lens, this lamp produces a rectangular beam of light; just the thing for rectangular A-boards and other types of displays. A banner hanging above the marquee, possibly from the vertical sign, can be very effectively illuminated with PAR-

CHARTS, such as the one seen, are valuable aids to the proper selection of spotlamps, and of floodlamps to achieve maximum desired effect.

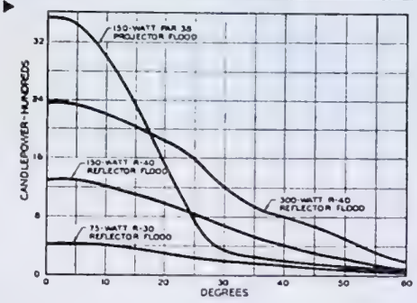
PAR-38, R-30 and R-40 LAMPS

Approximate Initial Candlepower and Lumen Distribution

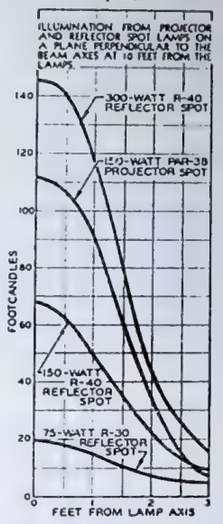


SPOTS	10°	20°	30°	60°	Hemisphere 0-90°	Total 0-180°
75-watt R-30	45	130	220	380	710	720
150-watt R-40	145	430	660	1050	1650	1700
150-watt PAR-38	250	760	1100	1350	1800	1800
300-watt R-40	330	970	1450	2100	3200	3300

FLOODS	20°	40°	60°	120°	Hemisphere 0-90°	Total 0-180°
75-watt R-30	40	140	270	580	700	720
150-watt R-40	120	430	810	1550	1600	1700
150-watt PAR-38	310	940	1350	1750	1800	1800
300-watt R-40	220	790	1500	3000	3200	3300



FOOTCANDLE PROFILES
PAR-38, R-30 and R-40 Spots





THIS 200 watt lamp is only available for use as a spot lamp. Its concentrated beam provides a lamp that has excellent light control values.

THE ENTRANCE

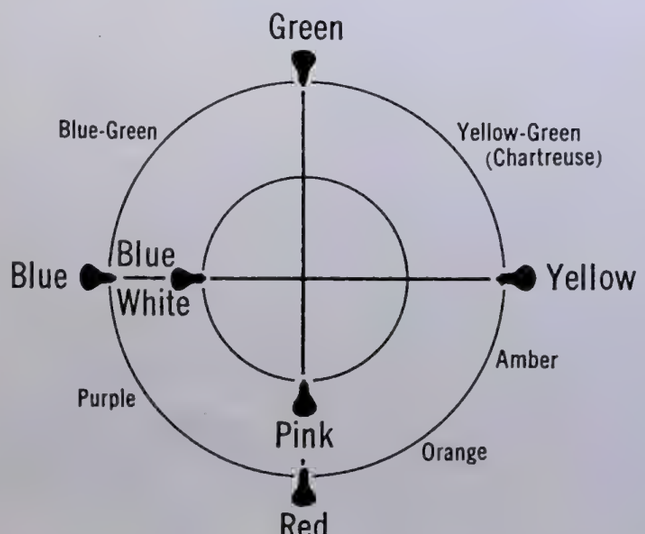
Lighting at the entrance of a theatre plays an important part in attracting potential patrons from a distance. The floodlighted banner over the marquee, the well lighted attraction board on the marquee, and the scintillating or chasing lamps around the attraction board all do their part. PAR lamps — one for every ten square feet — provide effective lighting for large cut-outs on the attraction board or over the marquee. The use of a relatively large number of small sources offers flexibility in aiming and ability to emphasize certain areas. Building floodlighting, another phase of attracting attention, can be accomplished with a wide variety of techniques. For a smooth effect, PAR lamps can merely be mounted on top the marquee and aimed upward at the building. PAR-38 or PAR-46 spotlamps located close to the building will create a pattern of brightness; if widely spaced. If their spacing is equal to their distance from the surface, the result will be reasonably uniform and any projections from the buildings, such as cornices and raised decorations, will stand out in bold relief.

Emphasize Displays

As the patrons reach the entrance of the theatre, reflector lamps can be used to emphasize posters and other displays which describe the show. Where elaborate cut-out displays are used on the entrance attraction boards, PAR-56 floodlamps are recommended because of their rectangular beam. And the PAR-56 floodlamp is useful for lighting the banner which hangs across the sidewalk under the marquee. Its rectangular beam means that light is utilized effectively and glare can be minimized.

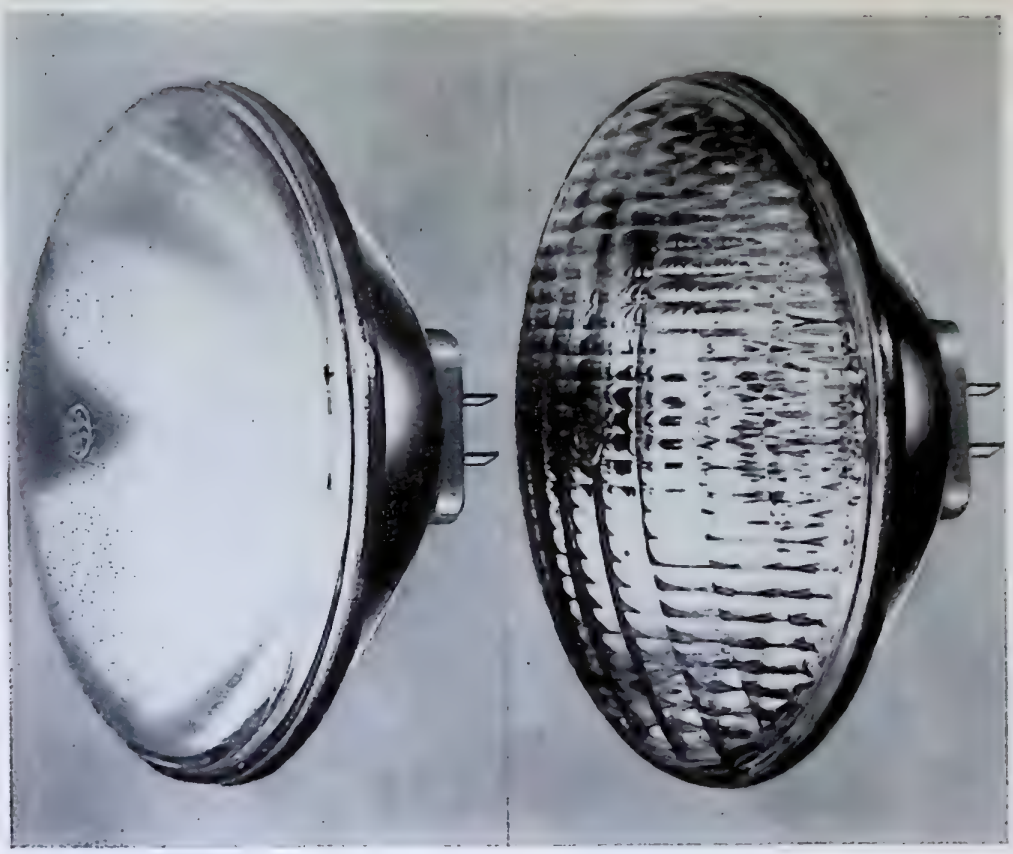
The use of projector and reflector lamps as downlights in the soffit of the marquee is becoming wide-spread practice. The R-40 floodlamp is particularly popular in this application. The sparkle provided by these lamps, which protrude slightly beneath the soffit, helps give the theatre entrance a clean and distinctive appearance. Reflector color lamps offer new opportunities for better showmanship in this type of installation. They will add both color and sparkle to the theatre entrance. Blue-white reflector color lamp downlights will provide a cool appearance. Or, pink reflector color lamps will cause the entrance to take on a warm, friendly atmosphere, so desirable for a cool evening. Arrangements of reflector color lamps can also form festive patterns for holiday seasons. At Christmas, for instance, alternate red and green, or patterns of red and green reflector color lamps will not only provide color accents, but the mixture of light below will be warm and friendly.

The boxoffice is, of course, a focal point. Brightness is the most important factor here. Reflector lamps can be used to provide additional general lighting in the area. In addition, the concentrated



COLOR MIXING

UNUSUAL AND FLATTERING effects are possible simply by taking different colored lamps and mixing their beams. Six colors are to be had.



THIS 300 watt PAR 56 is available both as a flood lamp (left), and as a spot lamp (right).

light from reflector or projector lamps aimed at the boxoffice counter will help the cashier make change. They will also help the customers count their change and therefore speed up transactions at the boxoffice. Care is needed, however, in positioning and aiming these lamps to avoid annoying glare and reflections from polished counter surfaces. A reflector lamp can help keep the cashier warm in the wintertime. A 125-watt or a 250-watt infrared lamp can be mounted in a portable heat-lamp holder under the counter or on the ceiling above.

Helps Direct Traffic

Light can help direct theatre traffic because people tend to go toward the brightest areas. A "path of light" from the boxoffice to the entrance will help guide patrons. The ticket taker as the theatre's official greeter can be dramatized with reflector lamps. In many theatres the insides of the doors at the entrance also need additional light. Patrons tend to leave the theatre through the entrance door because this door is open and is brightest. Emphasis placed on the exit doors with 150-watt reflector spots can help reduce this problem.

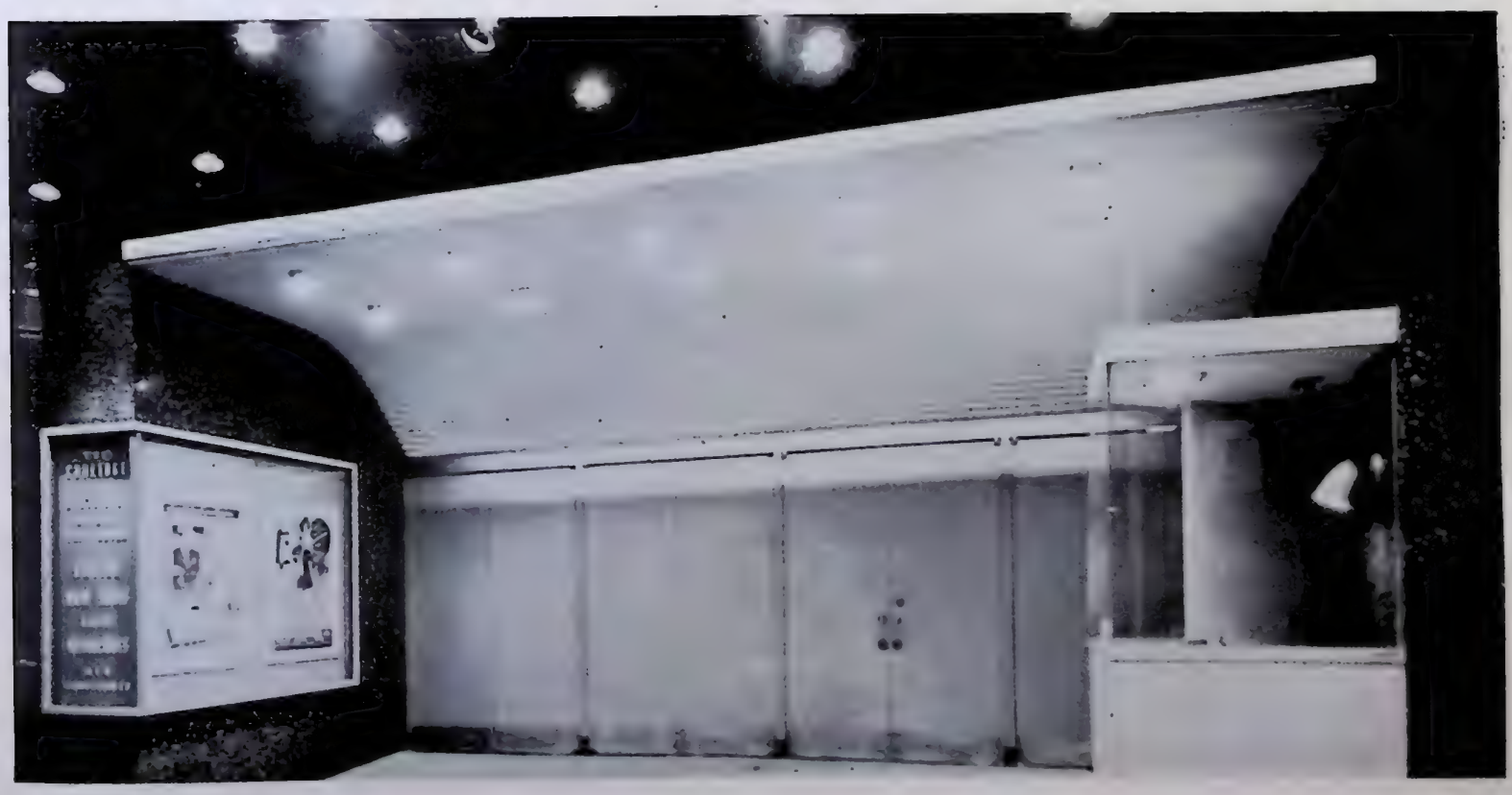
SINCE THE boxoffice is a very important area brightness is an important factor. Reflector lamps may be used to provide additional light.

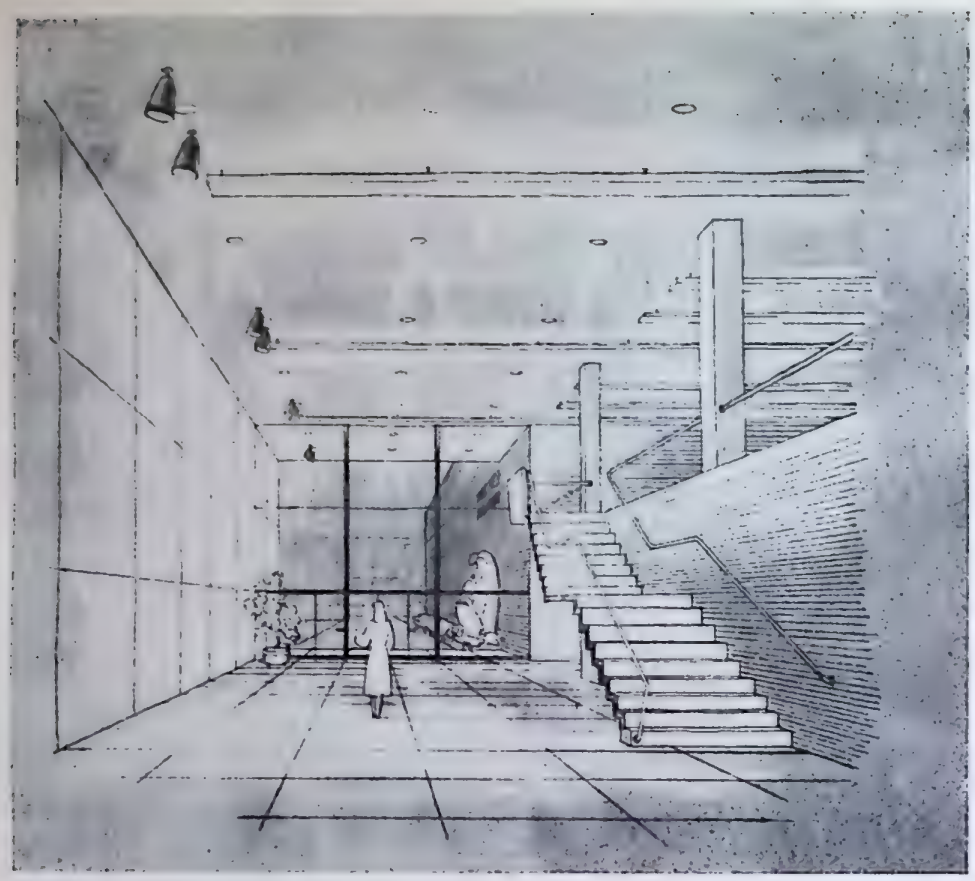
FOYER, LOBBY AND LOUNGE AREAS

One method of providing general illumination for circulation areas of the theatre is with downlights. Shielding these lamps to 45 degrees is desirable to minimize glare. Because of their more accurate control of light, 150-watt PAR lamps provide about twice as much light for this application as 150-watt R-40's. To obtain uniform illumination on the floor, space the units so that the distance between them is not more than two-thirds their mounting height.

For remodelling, downlights help direct attention away from an old ceiling. A light-colored ceiling is also important in reducing contrasts and creating a pleasant atmosphere. When ceilings are in good condition, reconditioning existing cove lighting equipment may be the least expensive solution. For a new effect, spots of color from reflector color lamps can supplement the smooth brightness pattern of a cove lighting installation. Aiming lamps at a grazing angle to the surface will dramatize textured or sculptured ceilings by modelling them in color. If there is space, these lamps can be mounted in existing coves; they can be fitted into urns and torchieres; and many types of wall units are available.

Planting boxes take on added interest with downlights above; or, lamps can be concealed behind them for silhouette effects. From this position reflector





SKETCH shows how downlight may be effectively used to light circulation areas of the theatre.

lamps provide light on vertical surfaces. Lighted walls contribute to a pleasant, cheerful environment and add to the impression of spaciousness of the area. Reflector lamps in small, decorative wall brackets are another method of lighting vertical surfaces; a 75-watt R-30 lamp to provide the downlight component and a 150-watt R-40 or a reflector color lamp aimed up, possibly at a small mobile or similar ornament, will increase interest. While paintings are usually lighted uniformly, PAR-46 spotlamps can supplement their general lighting and add interest by emphasizing specific areas. Posters and other displays can be lighted in the same way. Modelling sculpture or other decorative elements with reflector color lamps while at the same time accenting them with the beam of light from a PAR-46 or PAR-56 spotlamp adds a dramatic motif to an area.

WITH THE amount of revenue that is brought in by the concession stand, it is important that it be lighted in a pleasing and proper manner.

Attract Patrons

The snack bar is another important focal point. Supplementary lighting on feature displays will attract patrons' attention. High levels of illumination will help increase the size of the sale. While much of the lighting may be fluorescent, incandescent sources such as PAR and R lamps are needed to make merchandise sparkle and to provide emphasis. Reflector and projector lamps concealed in the front part of the canopy will direct light downward onto the merchandise on top of the counter. The PAR-38 and PAR-46 side prong lamps are particularly useful here because they require little depth for recessing. PAR-38 spotlamps in adjustable housings, mounted farther back in the canopy, can be aimed at the back bar displays. If the snack bar has no canopy, the same lighting results can be achieved by mounting PAR-56 spot or floodlamps on the ceiling.

Color can be used to advantage. The combination of a yellow and white reflector lamp inside the popcorn cabinet, for example, will bring out the rich, golden hues of the popcorn. They will also help keep the corn warm. Good, planned lighting will help your staff serve your patrons more efficiently.

AUDITORIUM AND STAGE

When the patron leaves the snack bar a path of light can lead him to the auditorium and to the usher, or the sign, that is directing traffic. Individually controlled, louvered PAR spotlamps at the head of each aisle have been used successfully to facilitate seating.

Reflectorized lamps have uses in the auditorium, too. A different type of downlight has been very effective in many recent installations. PAR spotlamps are recessed in the ceiling. Rather



than being aimed straight down the lamps are aimed 5 to 10 degrees toward the stage. The aiming angle is such that the back edge of the spotlamp's diverging beam is nearly vertical. Because of the aiming angle, patrons sitting behind the lamps are not distracted by them. The front row of units is located so that no direct light reaches the screen. It is recommended that the downlights be controlled by a dimmer for two reasons. First, the lights can be brought up gradually after the show so that patrons are not suddenly subjected to the lamp's full intensity. Second, the level of illumination can be adjusted to provide adequate illumination during the show for safe circulation.

As in the lobby, reflector color lamps offer many opportunities for color modelling in the auditorium. Managers of many smaller theatres are using reflector color lamps during intermissions to light the stage curtains, as well as the curtains on the auditorium walls. A three-color system with lamps on 6-inch centers is one method. In this case, lamps should be at least 18 inches from the curtains for a reasonably smooth lighting effect. These lamps have also been used advantageously in many older theatres for footlights. This is particularly true in footlights which contain no individual reflectors; those that are merely a wire-way with sockets on 3-inch to 6-inch centers. While additional shielding is sometimes necessary, the combination of an adjustable or swivel socket extension and a reflector color lamp provide a more efficient and economical system than the older dipped or natural-colored lamps. This same combination is also good for trough-type border lights. Stage lighting equipment using PAR and R lamps (border lights, strip lights, and spotlights) is available. Reflector lamps may also be used in other types of border and footlights, but the economics of the particular situation should be considered before a change is made. Despite the longer rated life and the convenience of the reflector lamps, it may be more economical to use regular lamps with reflectors and roundels or gelatine.

R-52 lamps, in appropriate housings, mounted on the gridiron are well suited as fly-loft work lights. PAR-56 floodlamps and smaller reflectorized lamps are also convenient as portable work lights for janitors and maintenance men. A theatre on the west coast uses PAR-56 floodlamps for a very unusual janitor's work light. A bank of lamps is placed in the aisle and aimed along the floor under the seats, making it easy to see and to work. Many maintenance men are using R-40's or PAR-38's either in clamp-on sockets or on a small portable stand. This type of equipment is convenient for providing the light necessary to repair seats or carpet and to do the many other odd jobs which are necessary.

EXTERIOR

The PAR line of lamps have a great many uses outside the theatre besides the entrance. Outside an exit, a PAR-38 lamp will provide enough light for patrons leaving the theatre. The rugged



WHEN THE PATRON enters the theatre a path of light can lead him to the auditorium, and to the usher or sign that is directing traffic.



ANOTHER TYPE of lamp which has many uses in a theatre is the sign lamp. These lamps may be had either clear or in colors for outdoor use.

bulb is not too easily damaged or broken. PAR-56 floodlamps may be mounted on the top of the building to light an exit alley, where a narrow shaft of light is needed.

Parking Lots

As to the lighting of parking lots, two methods are most frequently used for smaller lots:

a.) **Floodlights mounted on a building and directed toward a parking lot.**
b.) **Floodlights mounted on poles at the outer edge of a lot and directed inward.**

PAR lamps are applicable in both methods A and B — particularly for small or irregularly shaped lots.

Method A is a good solution for narrow lots which are next to or between buildings. It offers the advantages of easy mounting and easy maintenance. PAR-38 floodlamps mounted 25 feet high, 12 feet on centers, aimed 45 degrees downward and perpendicular to the building will provide adequate coverage from the building out to 80 feet. The average illumination will be about 1 footcandle. Except for nearby homes or hotels, the brightness of the lamps and stray light on adjacent property will not be objectionable.

Method B eliminates these two factors and provides good utilization of light. Three PAR-38 floodlamps on 25-foot poles, which are on 35-foot centers are one solution. Aimed down 45 degrees and 60 degrees apart, they will also cover an 80-foot strip.

Two other methods of lighting are usually used for larger parking lots:

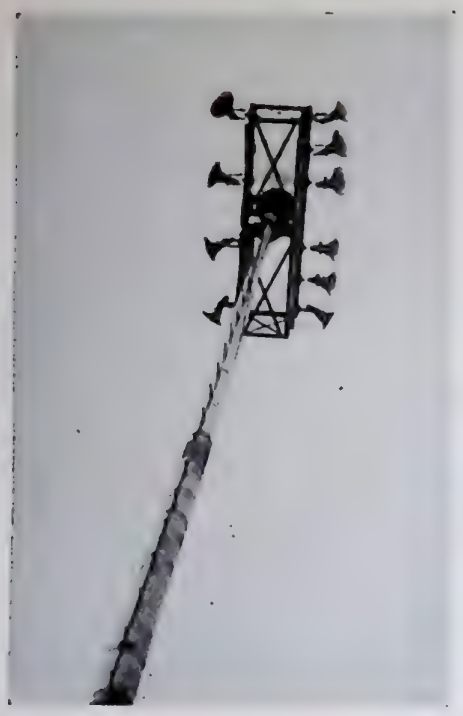
c.) **Floodlighting equipment mounted on high towers throughout the lot.**
d.) **Conventional street lighting equipment on appropriately spaced standards.**

For method C, one solution is 12 1500-watt enclosed floodlights per 80-foot pole, poles mounted on 400-foot centers. The lighting result is dramatic and because four poles are needed, appearance of the area is clean and uncluttered.

For method D, incandescent, mercury, color-improved mercury, or fluorescent units are used. Of particular interest is fluorescent, for its distinctive appearance, low operating cost, long life, and, as contrasted with either mercury type, good color effect on the appearance of patrons and automobiles.

THE DRIVE-IN THEATRE

The drive-in theatre's power to attract attention, its identification, and its ability to handle cars without congestion are important. A well-lighted entrance and a floodlighted screen tower supplement the lighted attraction board and add tremendously to the attractive power of a drive-in. As on the theatre building, PAR lamps can be mounted on the screen tower, or on the ground near it, to floodlight it. Another method is the use of a canopy containing reflector lamps at the top of the tower. These lamps should be on 18-inch centers and 18 inches or more out from the tower if white light is used. If in color, spacing must be reduced in proportion to the absorption of the color filters in order to produce similar effectiveness. Colored light on colored surfaces can produce unique and potent effects. This not only imparts distinctiveness, but helps get attention by being different. Blue light on a blue surface, for example, can produce an illusion of great depth. Or, alternating red and green light on a red and white design will create startling changes in pattern, brightness, and color. Reflector color lamps are a convenient source for this purpose, providing they are protected from rain and snow. To produce equal color effects, use numbers of reflector color lamps in the following proportions. 1 white: 2 pink: 2 yellow: 4 blue-white: 5 red: 8 green: and 10 blue. Floodlighting in



MOONLIGHT UNIT showing arrangement of floodlights. Four additional floodlights at back of pole provide white light for D-I exit areas.



AS THE CAR approaches the ticket booth of a drive-in, the driver should be able to easily identify the ticket sellers, as pictured here.

this manner, from the top of the screen tower, also lights the grounds beneath the tower. If the entrance to the theatre is by the screen tower, this overhead floodlighting will produce additional grounds lighting.

Play Areas

Scallops and other patterns of colored light on the outside of the fence also attract attention. Reflector color lamps, in appropriate housings on 6-foot centers and 1-foot from the fence, are one suggestion. For the drive-in's that have them, kiddies amusement parks provide a great deal of attraction, particularly if these amusement parks are situated so that the children in passing cars can see them. These play areas should be floodlighted; one PAR-56 floodlight for every 30-40 square feet of ground area. Lighted in this way, children in passing cars will be sure to see them, even after dark, and illumination levels will be adequate for safety and enjoyment.

Identification

Rapid identification of the drive-in and its current attractions is facilitated with light. A large filament lamp sign on the screen tower or above the attraction board identifies the theatre. A well-lighted attraction board tells the motorist what's playing. Large floodlighted cutouts, both ahead of and in the entrance area will also tell him what's playing. These should be floodlighted with one PAR lamp for every 10 square feet of surface area.

Approaches to the boxoffice should be well lighted. A driver should not be able to make a mistake or become confused in trying to reach the boxoffice from the highway. Conventional street lighting equipment is one method of lighting approach ways. Fluorescent street lights are particularly well suited. Controlled beams from spot or floodlights high on the screen tower are another method, provided the screen tower is near the entrance. Care must be taken, however, to insure that light from these units does not bother patrons or passing motorists. Low mushroom units or other ornamental units along the edge of a drive will also mark it so that the motorist knows where he's going. These should be no farther than 25-feet apart, and even closer on the outside edge of turns. Garden lighting techniques offer a fourth possibility. Trees along the roadway can be silhouetted by placing PAR-38 floodlamps behind the trunks and directing the light up into the foliage. Or, trees and shrubbery may be lighted directly from in front to provide a lighted hedge along the approach way. Mercury lamp floodlighting provides a distinctive color which is appropriate on foliage. Care should be taken in floodlighting large trees so that they do not become a distraction for patrons inside the drive-in.

As the car approaches the boxoffice, the driver should be able to see and identify the ticket seller. A PAR-38 or PAR-46 spotlamp aimed at the ticket seller's position will immediately identify this individual. An R-40 spotlamp should be aimed at the driver's window of the car to help the driver count his tickets and change. It will speed up traffic through the entrance.

Aids Parking

After the patron has paid his admission and has been asked to turn off his lights, the drive-in operator is responsible for enabling him to get safely to a parking place. Well-shielded reflector lamp downlights along the inside of the fence are a good method of lighting the roadway, at the same time permitting the patron to adapt his eyes to the semi-darkness of the parking area. Lighted ramp markers and portable directional signals are also available to help direct traffic.

Natural moonlight from a full moon on a clear night (0.025 to 0.03 footcandles) is usually considered adequate for general illumination in a drive-in theatre, and would be enough light to guide the patron into an empty parking place once he was on the correct ramp. The drive-in operator has no control of "natural" moonlight, however. To provide drive-ins with a constant level of illumination during the show an artificial moonlight system has been developed. A 100-foot metal pole is erected at the center of the last ramp with a number of floodlights located at the top. Two of these, directed at the center of the parking area, contain 500-watt daylight lamps behind green cover glass; two which are directed at the sides of the parking area have 300-watt lamps and amber cover glass. These two groups of lamps are used during the show. The combination of colors is pleasant and the result is subdued enough to avoid distraction from the picture. The imposing height of the poles and the shafts of light add a much needed dramatic effect, actually giving the feeling of shafts of moonlight. While reflected light from the screen takes care of the front ramps, the moonlight system solves the problem of lighting the rear ramps. This system provides an artificial moonlight which is superior to natural moonlight because it is constant in light output, and practically no light falls on the screen.

Emptying the Drive-in

At the break and at the end of the last show extra illumination is needed to facilitate the patrons finding the concession area, as well as emptying the drive-in. The old practice of locating floodlights on the screen tower to light the parking area creates an unpleasant effect and uncomfortable glare. The tower for the moonlight system is a much better location and three 1,000-watt floodlights can do an adequate job. A supplementary lighting system is also desirable. Lighting for the safety of fast moving automobiles at the exit can be provided by PAR-38 floodlights on the top of the fence aimed downward and in the same direction as the flow of traffic. These lamps will also indicate the direction of the exit to the motorist who is still on the ramp. A PAR-56 spotlamp will help protect the person directing traffic, both at the drive-in exit and in the street outside.

Concession Building

PAR-56 spotlamps on top the screen and moonlight towers and directed at the concession building will provide the light necessary for identification of the snack area of the drive-in. (One for every 20 square feet of outside wall area). Another method is the use of R-40 downlights around the outside of the concession building. 150-watt reflector lamps are placed on 3-foot centers under the outer edge of the concession building canopy, aimed 25 degrees from the vertical. If these lamps are on a

dimmer control, they may be dimmed to a suitable level during the picture to retain emphasis without annoying brightness.

Lighting of the interior of the concession building of the drive-in theatre is similar to the snack bar of the regular theatre, the same techniques as in stores. In addition to general illumination, spotlighting can accent displays. Adjustable PAR lampholders may be built into the ceiling to provide flexibility for changing displays. Bullet type housings for reflector lamps may be suspended from the ceiling, and provide an attractive method of supporting R-40 spotlamps. By aiming the spotlights at high profit items — the merchandise that you want to sell — turnover can be improved and profit increased.

OTHER LAMPS

The theatre operator will find many uses for lamps other than projector and reflector lamps. Sign lamps, either clear or in colors, may be used for outdoor signs; under and on marquees, and for many interior applications. The color is a fired-on, glass-like material that will not scratch, chip, peel, or come off when exposed to the weather. Colors are bright and clear. They are designed for maximum appeal, both in combination and alone. For scintillating signs and running borders there are the 10 and 20-watt flashing sign lamps. These lamps are gas-filled so that they go out quickly when the circuit is opened. The result is a clean-cut, sparkling effect.

The GA lamp — the lamp with the built-in shade — is a complete lighting device in itself and is ready for use in open-type single or cluster ceiling fixtures, such as many of the fixtures in corridors, passage-ways, and restrooms that now use bare lamps. Designed for base-up burning, the lamp has an enameled bowl of a warm pleasing tint that directs approximately two-thirds of the light upward and one-third downward.

Also available for these areas as well as for lounges, lobbies, and other areas of the theatre are circline fluorescent lamps. Available in three sizes, 8-inch, 12-inch and 16-inch diameter, the lamps can be used alone or in conjunction with incandescent and fluorescent lamps to form lighter decorative elements, or in a functional fixture as a convenient light source.

Air sanitation, along with refrigeration and heating, is an important function which must be performed by the theatre's air-conditioning system. Germicidal lamps provide 2537 A ultraviolet, which is effective in destroying molds and bacteria. These lamps can make the recirculated air as pure as outside air, if installed to provide ultraviolet watts equal to the cubic feet per minute divided by three times the minor dimension of a duct. Four-watt ozone lamps, too, are useful. Their radiation reacting on the oxygen in the air forms ozone, which has the ability to mask and destroy odors. They are particularly effective for lounges and public rooms. One ozone lamp should be used for each 1000 feet of space served. Both ozone and germicidal lamps must be used in fixtures which shield the lamp from direct view.

Colored Fluorescent Lamps

One of the most significant advances in fluorescent lighting in the last few years has been the introduction of deluxe colors. These are of particular interest to the theatre operator because they produce far better color appearance of room finishes, patrons' complexions, and decorations than earlier types of fluorescent lamps. Deluxe cool white lamps create almost exactly the same appearance as natural daylight and are particularly useful with open front designs. Deluxe warm white lamps provide effects similar to incandescent lamps and create a warm, inviting atmosphere.

The 40-watt rapid-start fluorescent lamp can now be dimmed over a 100 to 1 range in brightness. Its high light output per foot and easy replacement make it well suited for use in the auditorium as well as in other areas of the theatre. They are available in the full line of colors. Colored fluorescent lamps are more efficient than colored incandescent lamps. For example, a 40-watt blue fluorescent lamp provides 20 times as much blue light as a 40-watt incandescent lamp. Furthermore, fluorescent lamps don't change color as noticeably as incandescent lamps when they are dimmed.

Black Light

For the theatre operator using black light, the new BLB fluorescent lamp provides a convenient black light source. The bulb of the BLB is a black light filter; therefore, this fluorescent lamp may be used in conventional fluorescent light equipment (coves, displays, etc.) with no need for a separate ultraviolet filter. Where a more concentrated source of ultraviolet radiation is needed, there are two PAR mercury lamps, a spot lamp (H100-SP-4) and a flood lamp (H100-FL4). These lamps require ultraviolet filters to eliminate visible light. If more black light is needed from a single source, it can be obtained from the more powerful H250-A5 mercury lamp. This lamp requires a filter and separate reflector.

CONTINUOUS ROWS OF colored fluorescent lamps along the ceiling and in vertical fixtures along the side walls may be supplemented by concealed lamps in coves to give gradual wall toning and color effects. Projector lamps in adjustable sockets supply directional downlight to spotlight centerpiece.



Theatre Turnstile System

Theatre Turnstiles Offer an Efficient Admissions System That Will Only Require the Services of a Single Employee

BRIEF: *In these days of rising costs . . . it behooves the exhibitor to look for ways and means to cut down on his overhead . . . This is particularly true at this time when the average small motion picture theatre operator is spending large sums of money to install the various new projection and sound devices necessary in order to attract the public.*

This article discusses an admissions system which would make it possible for the small theatre to eliminate the need for a ticket-taker . . . tickets . . . and the ticket machine . . . By installing a specially developed turnstile the cashier can perform all of the necessary functions . . . including accepting money . . . and accurately recording the transaction . . . The system is fairly simple to install and operate . . . and offers many advantages to the exhibitor who is seeking ways of decreasing his operating costs.

As a result of the better grade of pictures being produced, and the various new forms of film presentation which have helped to bring long-lost patrons back to the theatre. However, the expenses involved in the operation of a motion picture theatre have also gone up. Many exhibitors have had to go to great expense to install such things as wide screens, stereophonic sound, new lenses, etc. Therefore, anything which would help to cut down on the overhead of a theatre should be of interest to the exhibitor.

Cut Overhead

Something which comes under the above head is the theatre turnstile system offered by the Perey Turnstile Company. By using this turnstile system it is possible to eliminate the need for conventional tickets, the ticket taker, ticket machine, etc.

The cashier collects the admissions and the turnstile checks the cashier by means of a register in the unit. No tickets are required as the turnstile automatically counts each patron entering the theatre. This turnstile is said to be so accurate that it is acceptable to the Internal Revenue Department for tax purposes.

Simple Operation

The Perey Theatre Turnstile system is very simple in its operation. The boxoffice is equipped with a theatre-type, registering, two-way turnstile under the control of the cashier. The patron pays his admission charges to the cashier and then passes through the turnstile which automatically records the transaction. As a result of properly designed railings, located so that the entrance passageway is always under the control of the cashier, the patron is guided from the boxoffice into the theatre.

When there is a lower rate of admission for children than for adults, the turnstile is equipped with a second register which the cashier can put in gear to record children separately, as well as on the total register. Thus, the number of adults can be ascertained by subtracting the total on the children's register from the figures on the total register.

There is also an electric indicator which can be installed where it is visible to the manager so that he can tell at a glance when a customer has been admitted at children's rates. It is possible, therefore, to determine exactly what the cashier should turn in.



A THEATRE turnstile admissions system, such as the one seen here can help to reduce that overhead, and increase the cashier's accuracy.



A LIGHT automatically indicates the admission at child's rate. Adult's and children's admissions are separately registered by remote registers.

Rate changes during the day are handled by taking a reading at the time the rates are changed. This method is followed when the rates are changed on different days, such as Saturday, Sunday, or holidays.

Installation

These turnstiles can be used when the boxoffice is at the side of the lobby or in the center. Enough railing must be installed to guide the patron to the entrance door, preventing the person who has not paid from getting into the theatre. Perey systems are so designed so that there are always as many exits as required by the Fire Department. The entrance is constructed so that it takes a minimum of space and is an additional exit is case of emergency. The Perey Theatre Type Turnstile is always of the two-way passage type, permitting free exit in case of emergency.

The turnstile itself is easily installed on the wall of the boxoffice. It may be necessary to reinforce the walls of the booth since there is a considerable strain on the fastenings when someone pushes against the arm if it is in a locked position. A pair of 2 by 4 inch timbers, upright, will usually take up the strain very satisfactorily.

Operating controls for the system are worked by the cashier inside the booth through means of running steel rods from the back of the turnstile through the booth wall, with a foot pedal attached inside the booth which unlocks the turnstile when the pedal is depressed. This child register is put in gear by means of hand lever, worked by the cashier from inside the boxoffice.

The child register overhead indicator is connected electrically to the turnstile by means of a switch actuated by turning the arms when the child register control lever is operated by the cashier in unlocking the machine for passage.

Design Features

The Perey Turnstile is said to be the only one available that has been especially developed for theatre work. The machine, according to the firm, is the result of several years continued evolution and cooperation between engineers and prominent theatre operators.

Special features have been built into the machine to relieve the cashier from operating the turnstile. When the patron passes through the machine he is unconsciously doing the work, and registering himself. The turnstile is so designed that the cashier can easily lock the machine if she does not wish someone to enter.

The register is arranged to facilitate easy and frequent readings. It also has been carefully designed to provide maximum protection against tampering and manipulation. The meter registers to 99,999, and automatically returns to zero.

The machine is hung on the booth wall instead of being provided with a conventional stand supported from the floor. Most theatres have a ramp starting at the booth. The angle of the ramp makes it difficult to install the conventional turnstile so that it will line up and still make a pleasing appearance. The wall type arrangement makes it easy for the maintenance staff to keep the floor clean around and underneath the turnstile.

As mentioned before the turnstile is a two-way passage operation. It permits passage for either entrance or exit. It registers on entrance, but is non-registering on exist, thus avoiding any possible confusion or error in the record. This exit feature has another advantage in that it often helps compliance with Fire Department regulations.

While offering ample space for patron use, the turnstile occupies only three-fifths of the space required for the conventional 4-arm turnstile. Patented movement of the arms and hubs permits the use of rigidly fastened arms, eliminating all cams and wearing parts.

Special attention has been given to the design so that the turnstile functions with feather-weight action. The machine has rounded corners to prevent injury, and to let the patron ease through the unit.

Summary

The type of theatre which is suitable for a turnstile-type operation may look for the following advantages if the system is installed:

- Lower payroll expense because ticket-taker is unnecessary.
- Elimination of ticket, ticket machine, and boxoffice expense.
- Elimination of ticket manipulation.
- Less opportunity for pilfering by the cashier.
- Accurate, impersonal, tamperproof count of patrons.
- Dependable check for absentee management on business done.
- Reduced opportunity for "gate crashing" at entrances.
- Less confusion at entrances—patrons going in separated from those coming out.
- Cashier's job easier — no tickets or ticket machine to bother with — can give more attention to making change correctly, and serving patrons.





THE TURNSTILES may be installed for use with the ticket booth in the center (left) and also with booth located on theatre's side (right).

Automatic Door Openers

The Use of an Automatic Door Operator in a Theatre Can Result in an Increase in Patronage, Profits and Safety

BRIEF: *As science and industry continues to make living simpler and easier for the average person . . . it becomes more and more important that the motion picture operator keep up with the latest innovations that mean greater patron comfort . . . for to ignore them is an invitation to disaster . . . One of the items which seems to be on its way to gaining full public acceptance in public buildings . . . such as theatres . . . is the automatic door operator.*

In this article . . . the author attempts to give the reader a better understanding of how these mechanisms operate . . . There is an analysis of the different types of automatic operators . . . how they may be modified to fit in with local building codes . . . etc. . . . There is also a section devoted to the component parts of these systems . . . as well as a discussion on the installation procedures involved . . . This article should prove to be of great interest and value to the reader who is looking for a safety feature that will help people into his theatre.

By Barry Johnson
Dor-O-Matic Division, Republic Industries, Inc.

Modern, progressive theatre operators are inviting increased patronage and profits with automatically operated exterior entrance and vestibule doors equipped with the Dor-O-Matic Invisible Dor-Man. Doors so equipped are friendly doors that graciously invite patrons in — and assist them out — speedily and without confusion, regardless of traffic volume.

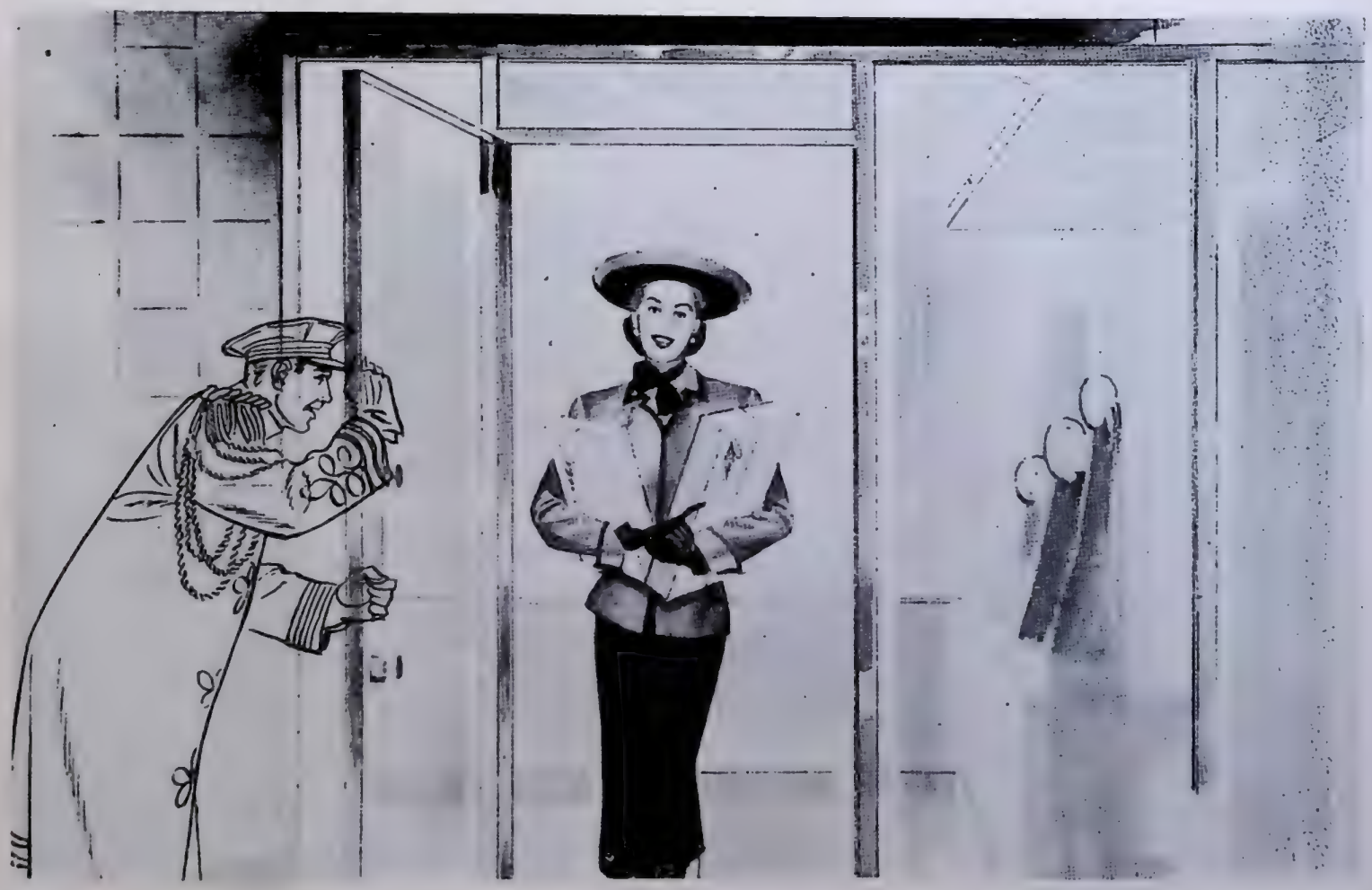
Completely Invisible

Completely invisible, the Dor-Man can be applied to all pivot hung existing doors with a minimum of alteration to the entrance and is economically adaptable to new or remodeled construction. It can be installed in an entrance way in a matter of a few hours. The Invisible Dor-Man then becomes a constant reminder to your patrons of your complete interest in their comfort, your desire to please them. As they approach the entrance to your theatre they are invited to enter, to be entertained by your feature by the completely automatic operating doors, and as they depart you furnish a double feature for as they approach the exit the Invisible Dor-Man safely speeds them on their way through the doors without confusion, without congestion.

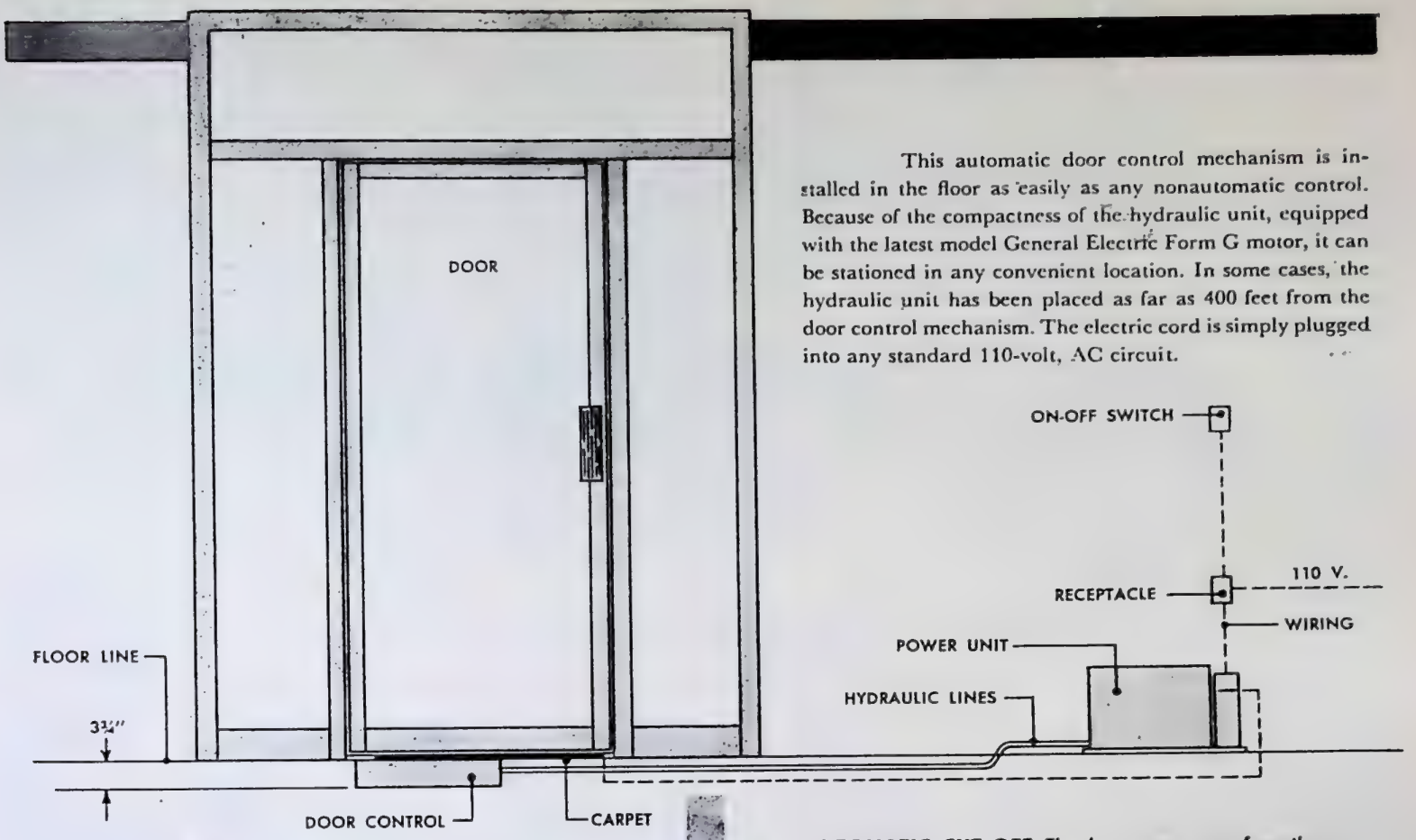
What is this device that assures the public of your progressiveness, your modern approach to the elimination of crowd confusion at your entrance, the speedy but safe flow of traffic in and out of your theatre? The Dor-O-Matic Invisible Dor-Man apparatus consists of a door control mechanism which is concealed in the floor beneath each door and a compact hydraulic power unit, which can be placed anywhere out of sight — as far as 50 feet away from the door control if necessary — and plugged into a standard 110 volt electric circuit.

Simple In Operation

The device is simple in its operation. The instant someone steps on the vinyl carpet which is laid through the doorway or in the alternate model, touches the push bar or handle of the door, the Invisible Dor-Man goes into action, opens the door quickly, quietly, automatically. The door stays open until



AUTOMATIC door opening mechanisms can do much to help increase patron safety, and is also something that will favorably impress customers.



This automatic door control mechanism is installed in the floor as easily as any nonautomatic control. Because of the compactness of the hydraulic unit, equipped with the latest model General Electric Form G motor, it can be stationed in any convenient location. In some cases, the hydraulic unit has been placed as far as 400 feet from the door control mechanism. The electric cord is simply plugged into any standard 110-volt, AC circuit.



IMPORTANT SAFETY FEATURES

AUTOMATIC CUT-OFF *The door opens away from the person who is entering. If someone is standing on the opposite side of the doorway, the automatic control provides absolute safety by not operating until pressure on that section of the carpet has been relieved.*

EMERGENCY MANUAL CONTROL *With the Invisible Dor-Man on duty, there is never a need to touch the door or handle. In case of power failure, however, the door will operate manually without locking or jamming—providing a safe exit during emergencies.*

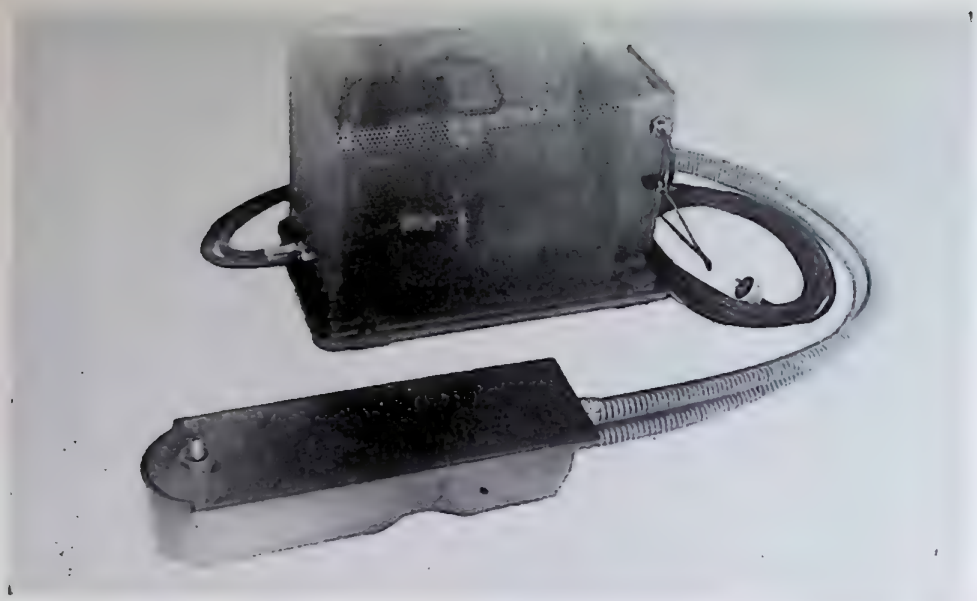
the person walks through the entrance way and then it glides to a closed position without a whisper of sound, mute testimony to its quality, design and construction. Closing is accomplished in a two speed action — quickly until almost shut, then slowly for the fast few inches to insure the noiseless operation. Door operation is unaffected by extreme temperature changes for the Invisible Dorman is designed to operate at −40 degrees to 130 degrees F.

The model which is designed for carpet or mat operation is installed with an 80 by 30 inch mat laid through the doorway. The light pressure of even a child's footstep will activate the hydraulic power control through a completely safe low-voltage, actually only 12 volts, control circuit. Once activated the hydraulic power unit applies pressure to the oil in the lines leading to the door control mechanism, causing the door to open. For safety's sake, entrance and exit doors are set to operate away from a person stepping on the door operating side of the mat. However, the door will not operate if someone happens to step on the opposite side until the pressure on that portion of the mat is relieved.

Another Type

The push bar or pull handle type operator eliminates the need for mats or carpets and permits all doors to swing out as required by building codes in many areas. The operation of the push bar or pull handle activated Invisible Dor-Man is similar to the mat operated model. If the entrance doors are outswinging, a person wishing to enter grasps the pull handle and exerts a slight pulling pressure. This pressure causes the electric switch incorporated in the handle to close the low-voltage circuit so the hydraulic power unit again applies pressure to the oil in the lines to the door-control mechanism, causing the door to function. The door then glides open quietly at a safe speed and stays open a set time, permitting the person to enter. Then the door closes smoothly and automatically. If a person should happen to stand in the way of the door after the opening cycle has been started a safety feature built into the specially designed pull handle will stop the door instantly when the handle contacts the person in the way. This is accomplished by an extremely sensitive electric contact switch which stops the door until the person gets out of the way. To start the door opening cycle again the person entering merely grasps the pull handle, applies a slight pulling pressure, the door opens and stays open until the person is safely in the lobby or vestibule. Then the door closes. Should another person enter during the closing cycle and again apply pulling pressure to the pull handle the door opening cycle is repeated. This insures a speedy, uninterrupted flow of traffic.

On exit doors equipped with push bars the operation is similar to that described above for the pull handle operated entrance door, except *pushing* pressure activates the door control mechanism. Again a safety feature is incorporated. If a person who is leaving the theatre has applied pressure to the push bar to start the door operating cycle and should continue to hold onto the bar, the drag of the person's hand will cause an electric switch to instantly stop the door. The opening cycle will be resumed the instant the person again applies pushing pressure to the push bar. Thus it will be noted that the automatic operation of doors equipped with handle-actuated push and pull bar INVISIBLE



THE MECHANISM required for the automatic door opener is fairly simple and compact. It can be installed with little or no alterations needed.

DOR-MAN units is exactly the same in principle as with conventional doors. This eliminates any possible confusion to your patrons.

Installation Procedures

For the convenience of those theatre owners and managers who are interested in more complete information on the application of the Invisible Dor-Man to their doors, details of a typical installation and a description of the operating portions of these automatic door operators is included in the following paragraphs.

The door control mechanism of the Invisible Dor-Man, as shown in figure 1, is similar in size and appearance to the mechanical type manually operated hinge which is set in the floor beneath the door. Therefore, it is possible to remove these mechanical type hinges from existing installations and enjoy the benefits of automatic door operation and still keep installation costs low. Usually no alterations are necessary to door frames and a minimum, if any, will be required with mat type operated doors. Often it is only necessary to remove the present floor hinge arm from the bottom of the aluminum, glass or wood door and install the arm which is supplied with the Invisible Dor-Man. Since the entire door control mechanism is contained beneath the door which is only 20$\frac{3}{16}$ inches long, 6$\frac{1}{16}$ inches wide and 3$\frac{3}{4}$ inches deep, limited alteration costs will be encountered in making provisions in the floor to accommodate this unit. Once installed in the floor this door control is completely concealed by the mat, by the existing threshold or a stainless steel floor dress plate which is available if handle type operators are specified. The only other alteration usually required to adapt the Invisible Dor-Man to existing doors is the drilling of two one-inch diameter holes in the floor to permit the insertion of two flexible metal conduits through the floor into the basement.

The two hydraulic lines and the low-voltage electric control wires which connect the door control mechanism and the power unit are protected by the flexible conduit. In this type of installation the hydraulic power unit is located in the basement directly beneath the doors for convenience and to keep installation expense to a mimimum.

If no basement is available to accommodate the power unit, it can be located over the doors, in a small closet-type area in the vestibule, or in any other convenient location within 50 feet of the doors. Installation costs will usually be less if the power units are located as closely to the door control mechanism as possible. Push bar and pull handle type Invisible Dor-Man installation costs are higher than those for mat type operators, if existing doors are being used because specially designed handles must be furnished by the manufacturer for simple field application. The hydraulic power unit is available for the operation of single doors, in which case one power unit is required for each door or it can be supplied as a dual unit to operate two doors independently of one another. This dual hydraulic power unit is popular because it results in lower overall costs. When this unit is specified, one dual power unit is required for each series of two doors. The dual operator can be installed to operate one door in and one door out, both doors in or both doors out.

The hydraulic power unit is operated by a 110 volt ½ H.P. motor which can be plugged into an existing 110 volt outlet or one installed specifically for the Invisible Dor-Man. The fact that special heavier voltage circuits are not necessary for proper operation also is a factor in keeping installation costs low. In the event of a power failure, the Invisible Dor-Man will operate manually without locking or jamming, thus providing a safe exit during emergencies.



WHEN HANDLING large crowds such as seen on the right, automatic door openers can be of great assistance in keeping crowds moving.

CONCLUSION

Progressive theatre operators should consider the increased profit opportunities offered by the installation of the Dor-O-Matic Invisible Dor-Man on entrance and exit doors. Its traffic-drawing attraction will increase patronage, while its quality manufacture and simplicity of design will insure trouble-free performance at a reasonable price. The complete cost of the Invisible Dor-Man for single door operation is approximately $795.00. The two door operator is approximately $1350.00. These prices do not include installation costs, which will vary slightly according to entrance construction conditions.

Wide Angle Slide Projector

A Discussion of the Construction Details and Uses for Recently Developed 3000 Watts Slide Projector

By J. P. LATIL
President, Genarco, Inc.

In 1952 the U. S. Patent Office issued U. S. Patent 2586436 for a new extra wide angle optical system known as GKP Wide Angle Oblique Projector (GKP Trade Mark 266404).

Used in conjunction with a slide projector, it throws a very wide, undistorted image at a short throw. The width of the image is 110 per cent the distance between the slide projector and the screen. This corresponds to an angle of projection greater than 60 degrees.

A new slide projector has been designed to take advantage of the features of that extra wide angle optical system.

BRIEF: ***A 3000 watts slide projector that incorporates a newly patented optical system which has a 60 degree angle of projection . . . is described . . . The source of light is a 3000 watts incandescent bulb . . . The manufacturer has endeavored to make a slide projector to project images larger and brighter than ever obtained before . . . The slide projector is supplied either with an automatic slide changer for advertising . . . or a manual changer for theatre background projection . . . Details are given on the construction . . . and many indoor and outdoor uses for the projector.***

The slide projector was made as powerful as possible in order to project images that were brighter and larger than any projected by other slide projectors.

Source of Light

In order to make a slide projector that could operate automatically, without an operator, an incandescent bulb was used in preference to an arc lamp. General Electric's 3000 watts projection lamp model 3MT32 base up is used because of its long life expectancy, its concentrated light, and its large lumens output.

The 3-1/4 inches by 4 inches slide was chosen because it is a standard size and large libraries of commercial slides of that dimension exist, and also because 2 by 2 inch slides would have been too small to withstand the light concentration and heat intensity emitted by a 3000 watts lamp.

Width of Image and Illumination

The following schedule shows the illumination and the width of the image corresponding to various throws:

Distance Between Projector and Screen	10′	20′	40′
Width of Image	11′	22′	44′
Illumination at Center of Image in Ft. Candles	60	15	4

Height of Image

The maximum height of the image depends on the angle between the optical axis of the slide projector and the horizontal. In Figure 3 the distance between the projector and the screen is 20 feet and the optical axis makes an angle of 30 degrees with the horizontal. The maximum height that can be obtained with the optical system is approximately 32 feet but as the slides are wider than they are high the height of the image will be in the same proportion $\frac{3.25}{4} \times 32$ feet $= 26$ feet. The image could be 22 feet wide and 26 feet high. If this height is too great, it can be reduced by using a paper mask in the slides.

In Figure 4 the throw is also 20 feet but the optical axis is horizontal. The maximum height given by the optical system is 22 feet but due to the rectangular shape of the slide, it is limited to $\frac{3.25}{4} \times 22$ feet, approximately 18 feet. Image will be approximately 22 feet wide and 18 feet high. Paper mask can limit the height, if desired.

Automatic Slide Changers

The slide projector can be supplied either with an automatic slide changer

FIGURE 1. IS A Photograph of the Genarco Slide Projector, Model SP.1 with a six slide disk changer. the rectangular shape of the slide, it is limited to 18 feet. The beam is over heads of people.



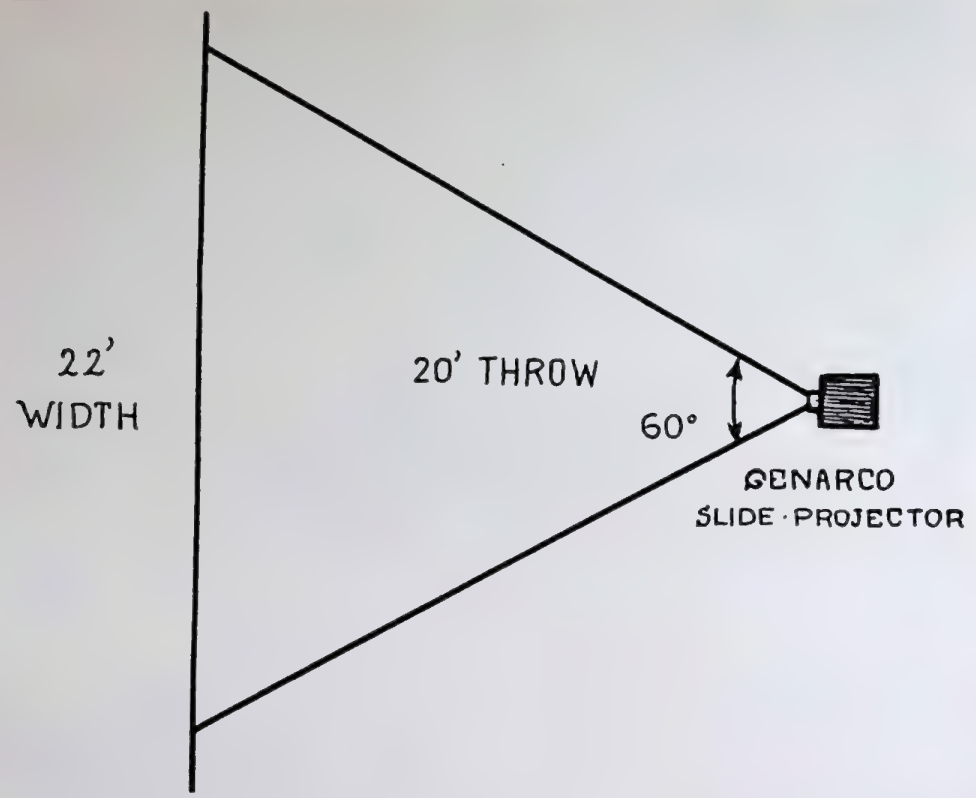


FIGURE 2. presents a diagram showing how the width of the image compares with the distance between the wide angle projector and the screen.

(Model SP. 1) or a manual changer (SM. 1).

In the automatic slide changer the slides are inserted around a disk and, depending on its dimension, six, 12, or 18 slides can be used.

An adjustable time device exposes each slide for five, seven, 10, or 20 seconds. It operates in the following sequence:

—an image is projected on the screen	
—the timing device comes into action	
—a shutter blacks out the image—closing from both sides like a theatre curtain.	(1/3 second)
—the disk rotates to bring the next slide into the optical system	(1/2 second)
—the shutters open briskly	(1/6 second)
—the new image is projected on the screen.	
Total time	1 second

The rotation of the disk is not visible on the screen as it is done entirely during the black-out period.

Cooling

An electric motor drives two blowers which cool the slides and the 3000 watts bulb. The capacity of the blowers is 220 cubic feet per minute. One of the blowers has its outlet placed just under the slide which is in the light beam. As soon as the slide enters the light beam it starts to be cooled by the air stream. After cooling the slide, the air stream cools the disk holding the slides. Therefore, the other slides mounted in the disk also get cooled. Both sides of the slides get the impact of the cold air. Part of the air blown by the slide blower cools the optical system enclosed in a housing which remains absolutely cold even after several hours' operation.

The second blower has its outlet exactly under the 3000 watts bulb. The air strikes the glass bottom of the bulb and moves vertically toward the top of the bulb and comes out of the lamphouse through a mesh screen without being slowed down by any obstruction.

The sides and the back of the lamphouse have double walls to increase the cooling and reduce the temperature of the outside of the lamphouse. Its front is cooled indirectly by the slides blower.

This very strong cooling system is necessary because in certain applications the slide projector will operate without interruption for hours—even 24 hours a day. For such application of projection of theatre backgrounds the slides have to resist the projection heat for a long period of time without breaking.

CONSTRUCTION

The slide projector is built to withstand corrosion and the action of atmospheric agents. The castings are made of aluminum. The steel parts, which are not made of stainless steel, are Parkerized, plated, or specially painted; to assure long life even when used in unfavorable weather conditions.

To protect the slide projector from the direct impact of rain, snow, and wind it is recommended that it be placed in a wooden or metal "box" slightly larger than the projector itself.

The motors, gears, and other mechanical parts have been engineered with the idea that the automatic slide changer would operate for thousands of hours (or several years) with a minimum of wear and maintenance. When the bulb is to be replaced every 100 or 150 hours, the maintenance man will spend a couple of additional minutes to clean the lenses and put a few drops of oil to guarantee smooth operation of the automatic slide changer. The mechanism should operate for thousands of hours without failure. The slide projector will often be placed on a roof and switched on automatically when night comes, and switched "off" at about 1:00 A.M. Nobody will take care of the lamp for several days. During that time the slide changer mechanism is expected to operate perfectly: Model SP. 1 is built and shop tested with that in mind.

USE OF AUTOMATIC SLIDE PROJECTOR

This unit is mostly for advertising as it is entirely automatic. It can be placed on a roof to project an image on a nearby white wall. The best locations are the spots where crowds pass or assemble at night, for instance, theatre and shopping areas, railroad stations, amusement parks, and also concession areas of drive-in theatres.

Excellent spots are also those that can be seen from cars having to slow down for traffic lights or tolls, or near the axis of a long, straight road on which a sign can be seen for a full minute by the occupants of a car using this road.

Indoors, the slide projector is placed in areas that are slightly darker than the rest of the room; in theatre lobbies; in large stores to advertise the day's specials; or make intriguing window displays; in arenas to announce future events, or advertise the concession products.

The projection of large images is very impressive because of the rapidity of the



FIGURE 3. is an example of projection on a wall with the slide projector on a roof. Optical axis makes angle 30 degrees with horizontal.

change which holds the spectator's attention. As soon as people see that the picture is changing they stop and wait until they have seen the full cycle, and sometimes they see it twice over to see again one particular picture which caught their particular attention. No similar effect is possible with the ordinary lighted panel.

The automatic slide projector enables merchants to spend only a small amount of money for advertising as it is a co-operative form of advertising where each advertiser pays only one-twelfth or one-eighteenth of the total expense of projection. Larger firms can take advantage of that feature too by utilizing several slides to tell the story of their product (or service). For instance, a car dealer can project slides describing the various features of his cars on a screen placed on the roof of his showroom.

Manufacturers can show the various products they manufacture one after the other by projecting pictures of them over a white wall of their factory at night without defacing the wall.

As the slides cost only a few dollars advertisers can change them without great expense several times a year, if they so desire. If they had to have a panel repainted, it would be at a much higher cost. The slides which are not used anymore can be kept and eventually re-used when needed periodically such as for Christmas to extend their Christmas Greetings, etc.

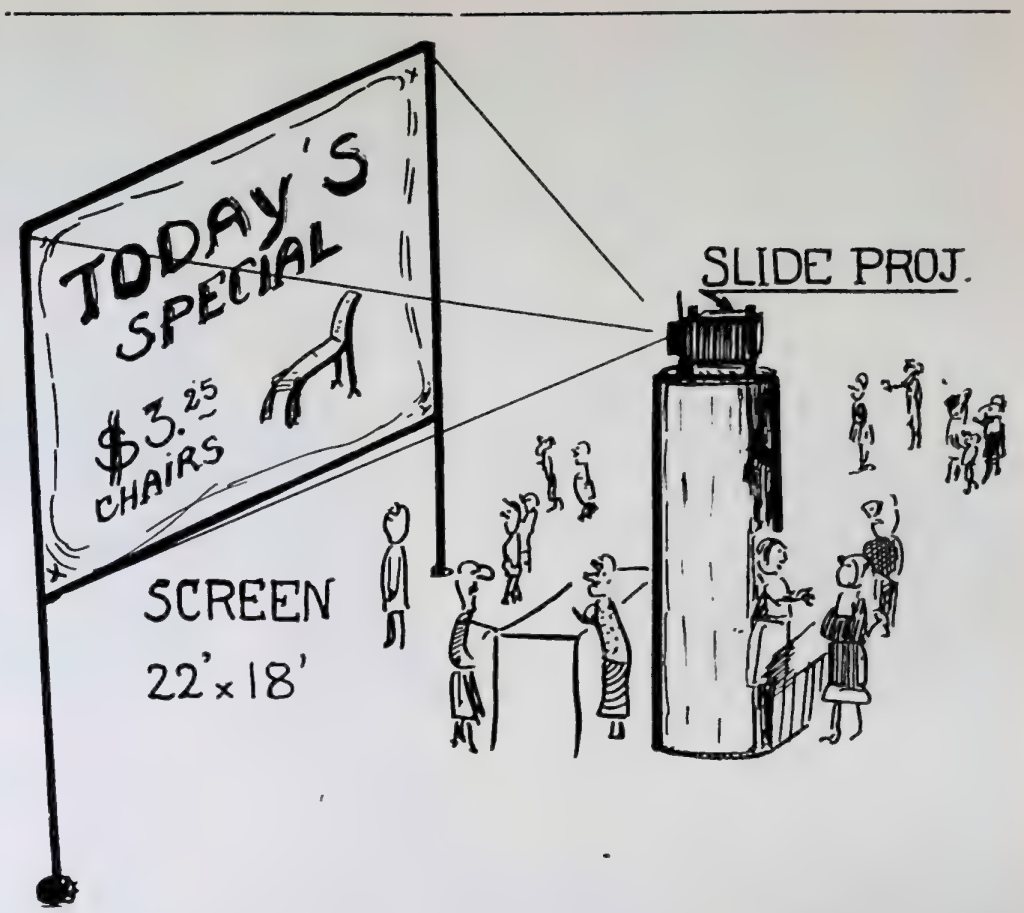


FIGURE 4. IS AN EXAMPLE OF the use of the Genarco Slide Projector in a store. The optical axis of the slide projector is horizontal. The maximum height given by the optical system is 22 feet, but due to the rectangular shape of the slide, it is limited to about 18 feet. The beam is over heads of people.

Theatre Backgrounds

With Genarco Slide Projector Model SM. 1 the backgrounds can be projected on a fully lit stage, without shadow from the performers, or the props, on the background and without distortion, even when the projector is not in front of the center of the screen.

The artist designs on a 3-1/4 by 4-inch slide and his artwork is faithfully transferred onto the background. A small slide replaces an expensive 400 square foot background. A cardboard box which contains a dozen of slides saves the expenses of warehousing, moving, and installing of bulky props. The background can be instantly changed without lowering the curtain. The slide projector is paid by the savings on the backgrounds of one show.

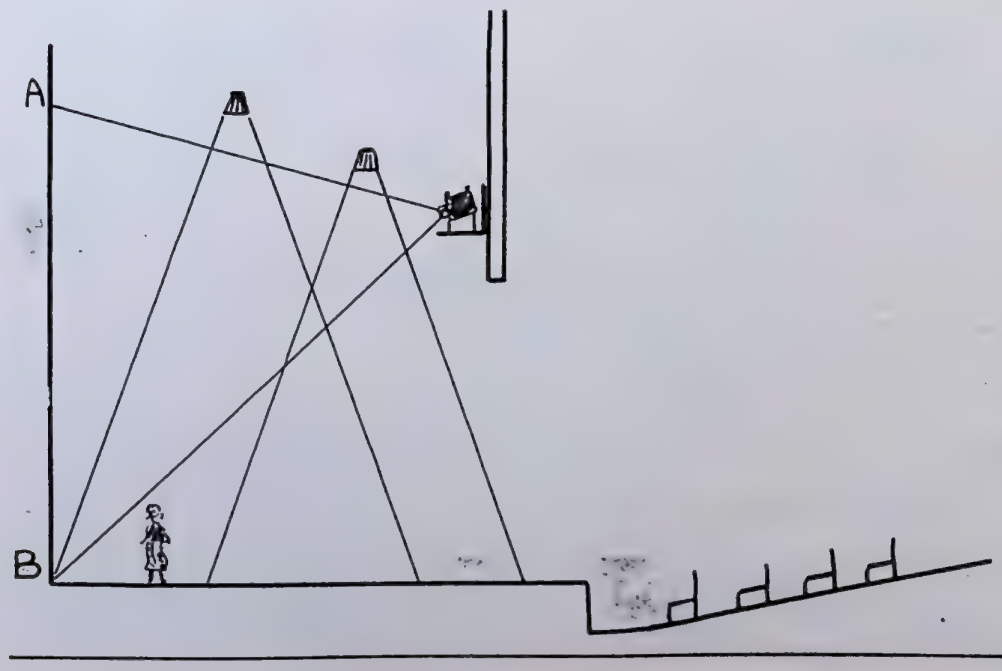
The slide projector comes as a compact, rugged, and self-cooled and self-contained unit, with the manual slides changer, and a fading iris. The iris is used to blackout the projection; to fade the image gradually, and even to increase the definition of the image if required in a particular case.

Figure 5 shows the location of the projector behind the curtain drop on the first bridge. Projector could be placed also in a side gallery. The stage lighting is set to have the stage illuminated but not the projected background. Performers do not interfere with the beam of light of the slide projector.

Known in Europe as GKP projector, it is widely used in theatres of Paris, Vienna, Amsterdam, The Hague, Stockholm, etc. Wonderful results have been obtained in the United States on several stages—in the large Berkshire Music Center at Tanglewood; at the Vincent Bowditch's small Barn Stages in several Summer Stock theatres; and University auditoriums.

In these days of fierce competition for the entertainment dollar, it is of greater importance than ever that the theatre operator do everything that is in his power to attract attention. By using equipment, such as this slide projector, it is possible to bring favorable attention to present and future attractions at the theatre. It is the kind of showmanship that pays off, if done properly.

FIGURE 5. SHOWS THE GENARCO Wide Angle Slide Projector in a theatre. The performers do not interfere with the background projection. The spectators cannot see the slide projector, and the stage lighting is adjusted to illuminate stage only and not background AB. Projector could be in side gallery.



Clay Tile for Theatres

A Review of the Many Uses and Advantages of Clay Material in Construction and Operation of a Motion Picture Theatre

BRIEF: *One of the most ancient and useful of all materials for building and decorating purposes . . . is clay tile . . . The history of its use dates back thousands of years . . . This material has a number of qualities which makes its use in the theatre advantageous . . . Some of these are clay tiles' ability to withstand the abuse of all types of weather conditions . . . it requires very little care . . . and the maintenance costs are practically nil.*

As this article points out . . . clay tiles are available in a number of sizes and many different colors . . . and are primarily used either as a covering for walls and floors . . . It has also been successfully used for attractive wall murals . . . There is information on the various types of wall and floor tiles . . . and a section on installation . . . There are many valuable tips on how to properly care for clay tiles . . . and other points which should prove to be of interest to the reader.

A material almost as old as show business itself still plays a leading role both out front and behind the scenes in the American theatre.

By Al Frantz
Tile Council of America

Clay tile, because of its unique combination of practical and decorative features, has been employed in construction for more than 7,000 years. It was used to embellish the early pyramids of Egypt, the great mosques of the Near East, the dazzling palaces of Spain in its golden age, and many of the great cathedrals and castles of medieval Europe.

In their search for materials that could take hard wear, clean easily and at the same time play a decorative role, theatre owners early discovered the advantages of clay tile. As a result, it is used today for lobby floors, wainscots, washroom floors and walls, cashier booth facings and for entire theatre facades.

Advantages of Clay Tile

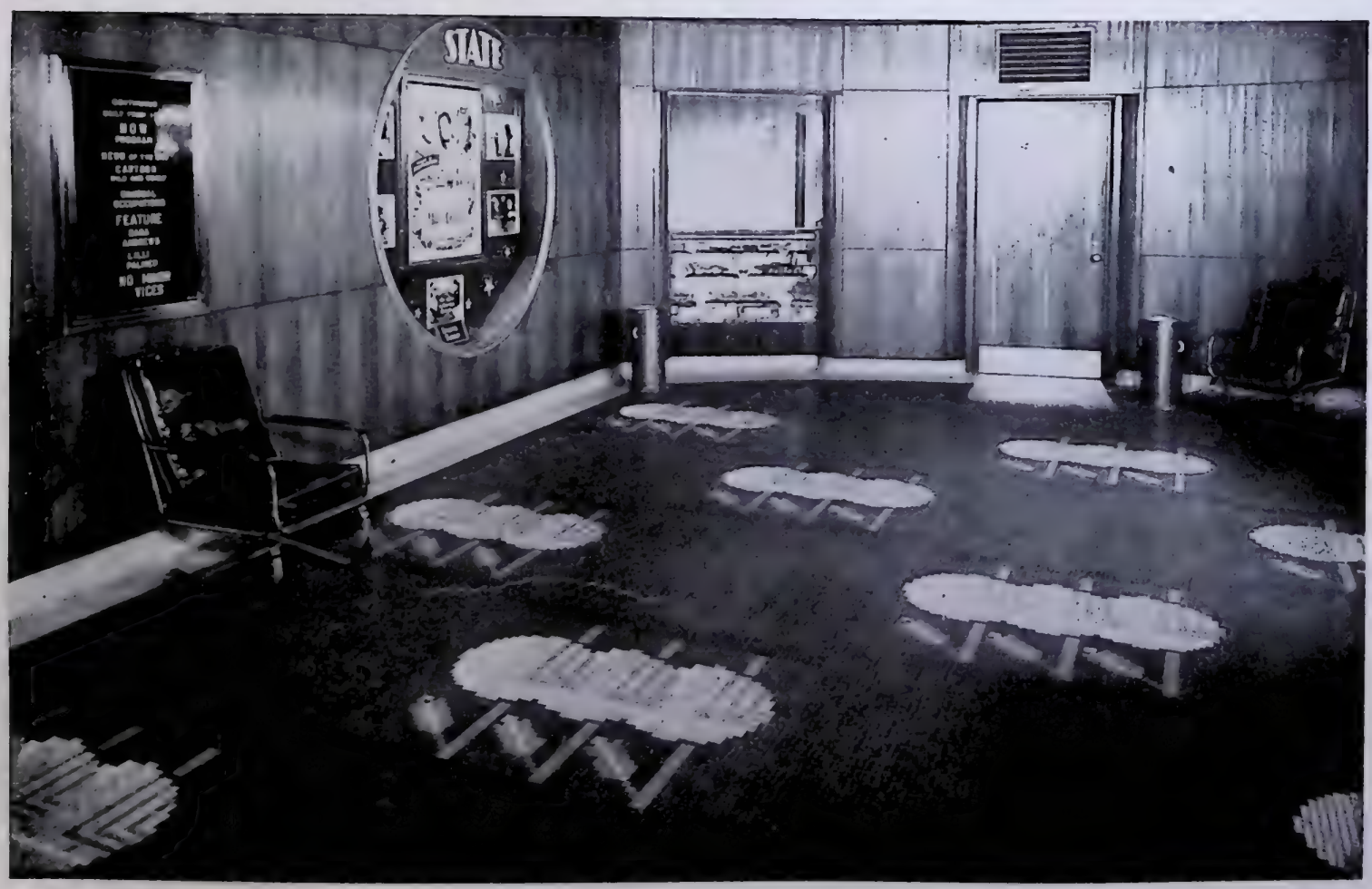
Clay tile is waterproof and nonabsorbent, and it takes exceptionally hard wear. Portions of Grand Central Station and of the New York Public Library, which are subject to extremely heavy traffic are surfaced with it, for example.

Clay tile stands up under any weather conditions. Its surface is not damaged by smoke, grime, smog or traffic fumes, and its colors are unaffected by these factors. It has the lowest maintenance and upkeep cost of practically any material, for it does not require waxing, polishing, varnishing or other refinishing.

It lasts the lifetime of any building—and in fact, much, much longer than the lifetime of the average American building. Clay tile floors and wall surfacings that have been in position for hundreds of years in Europe and the Near East are still in excellent condition.

Colors and Sizes

Clay floor and wall tiles today are manufactured in well over 200 shades of basic colors. Wall tiles in common use range in size from four and one-quarter inch squares to six by nine-inch rectangles, while floor tiles range from "dots" (11/32-inch squares) to nine-inch



THE WIDE RANGE of colors and sizes in which clay floor tile is made makes it ideal for use in lobbies, such as in State, Ann Arbor, Mich.



HUGE mural of clay tile on facade of Paramount, Oakland, Calif., (above) has made this building a local landmark. Simple washing with water keeps it clean. Use of clay tile in washroom (below) keeps maintenance down.



STRIKING effect was achieved on Circle, near Dallas, Tex., (above) with the use of tile in a terracotta shade. Clay tile won't fade with wear. Clay tile can also have many uses in lounges (below) of a fine theatre.





squares. In addition, floor tiles are made in a variety of shapes—squares, pentagons, hexagons, octagons, oblongs, rhomboids and diamonds.

Because of the wide range of colors, shapes and sizes, floor tiles can be worked into an almost infinite variety of patterns. A lively pattern can be used effectively to cut down the apparent area of a space—say, of a long lobby.

Wall Tiles

Clay tiles are divided into two main classes, wall and floor. Wall tiles have a glazed surface which is permanent and very easily maintained. The glaze may be either bright, which is highly reflective, or matte, which does not clearly reflect an image or is entirely without sheen.

The size of the wall tile unit to be used depends on the scale of the space. In general, architects prefer a smaller unit in small areas and a larger in large ones.

Wall tile is employed for wainscots in theatre lobbies, in washrooms, and sometimes as wainscots within the building itself. Finger prints, lipstick and other marks can be removed from it easily and quickly, so that it is particularly suited to any wall area that becomes soiled often.

A very striking use of wall tile is as entire murals for the exteriors of theatres. A widely known mural is that of the Paramount theatre in Oakland, Calif., which towers about 70 feet over that building. Another distinguished mural of clay tile is that on the NBC building in San Francisco.

Both of these have been in place some years and both are in as fine condition as when they were originally installed.

Floor Tiles

In general, floor tiles are unglazed units. Their color extends through the body, so that even after years of very heavy traffic they show little if any signs of wear.

There are three principal types of floor tile;

(1) **Ceramic mosaics.** These are the small units so widely used for washroom and bathroom floors. They are less than six square inches in facial area.

(a) The porcelain type. This type is produced by adding mineral oxides to the clay mix. It comes in a wide range of colors and is very resistant to the abrasive action of foot traffic.

(b) **The natural clay type.** The colors of this type are those of the raw clay in the tile body, although mineral ox-



CLOSE-UP OF poster spaces of Garden, San Jose, Calif., shows details of clay tilework, which is durable and easy to keep clean.

ides and stains are sometimes added. Natural clay tiles also withstand severe abrasive wear.

(2) **Pavers.** These may be either the porcelain or natural clay type, and are six square inches or more in facial area.

(3) **Quarries.** These are made from natural clays and have a dense body which makes them very durable. Brick red, buffs and chocolates are the colors most often made.

INSTALLATION

Clay tile should always be installed by experienced and reputable clay tile contractors. The Tile Council of America, made up of the 20 leading manufacturers of clay floor and wall tile, publishes two specifications for tile setting—the Tile Handbook, which covers installations in cement beds, and K-400, which covers the use of adhesives and other thin setting bed methods and materials.

The owner, the architect and the general contractor should make certain that one or the other of these books is used as a guide for all installations.

The conventional method of installing clay tile is to set it in a cement bed. This gives a wall approximately one and a half inches in thickness, and a floor about an inch and a quarter.

In the conventional method, wall tile is ordinarily set on metal lath over wood studs or furring. Very smooth monolithic concrete, brick, hollow clay block and concrete block also provide suitable surfaces for wall tile set in cement.

Floor tile can be set over wood construction, concrete slab or fill, and steel plate when the conventional method is used. This technique has been in use for centuries and the fact that tile set hundreds of years ago with it is still in place attests its value.

The adhesive method was first used in the late 1920's or early '30's and has been given full recognition by the industry. It is particularly adapted to dry wall construction and to remodeling work.

The increase in the use of dry wall has markedly stepped up the demand for adhesive installations of clay tile. In new work, the tile is usually applied over gypsum wall board or gypsum plaster brown coat. A number of other surfaces have also been used and specifications for them are covered in the Tile Council's "K-400."

On modernization projects, the tile contractor can install tile with adhesives directly over existing wall surfaces which are in proper condition. Under favorable conditions, adhesive manufacturers report up to 30 per cent savings with this method.

Whether the conventional or the mortar method is to be used should be a joint decision of the architect and the tile contractor.

MAINTENANCE

Clay tile is one of the simplest and easiest maintained of all materials. Soapless detergents should always be used for it. Those cleansing agents consisting primarily of trisodium-phosphate are least expensive and highly satisfactory.

The detergent should be mixed with warm water according to the manufacturer's directions and allowed to remain on the tile floor for a few minutes before mopping and rinsing. Trisodium-phosphate will not harm the tile or joints.

From time to time, if and as it seems necessary, a non-scratching soapless scouring powder should be used. Electric scrub brushes are helpful for large floor areas. When they are used, care should be taken to avoid wearing away of the grout between tiles.

Adequate rinsing with clean hot water is absolutely necessary.

Do Not Use Soap

Frequent washing with soap—and particularly soap in conjunction with hard water—will often build up a dirty film on tile floors. This sticky deposit, which consists of insoluble calcium and magnesium stearates, not only will pick up dirt but actually can make tile floors slippery. For these reasons soap should never be used.

If such a deposit has been built up on an existing floor, it can be scoured off with a commercial cleansing powder. Kerosene will also remove the scummy film.

Avoid Floor Treating Agents

Waxes, plastic finishes, polishes, special emulsions, non-slip coatings, etc., should ordinarily be avoided. The original ceramic tile surface is ideal from the standpoint of walking safety, sanitation and ease of maintenance.

Special floor treating compounds are therefore almost never required. Usually they detract in some way from the optimum performance of the floor. Quite often their use leads to further undesirable psuedo-corrective treatments. Moreover, in some instances floors have actually been rendered unsafe by proprietary preparations.

Whenever tile floors, whether paver, quarry or ceramic mosaic, seem slippery, greasy, scummy or dirty, give them a vigorous scrubbing with soapless detergent and scouring powder. Finally, rinse with lots of hot water.

Frequent cleaning thereafter insures easy maintenance. This old-fashioned method is economical and much more satisfactory than using expensive new-fangled floor compounds.



USE OF CLAY tile for wainscot and balcony makes maintenance easy, as warm water and a detergent removes finger prints and other markings.



See THE DIFFERENCE WITH **BEVELITE** PLASTIC LETTERS AND PLEXIGLAS BACKGROUNDS

Bevelite Changeable Plastic Letters are easier to read from greater distances. Actual beveled fronts and brighter colors make them more eye-catching both day and night. They fit easily and securely on the track because of the exclusive metal lock-lugs that also protect them from breakage. But, there's a story behind the letters... Bevelite Plexiglas Backgrounds. They are tops with sign men and exhibitors from coast to coast.



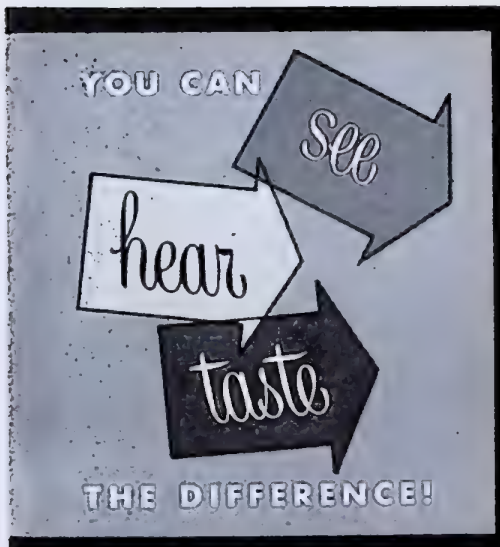
The self-locking vertical truss construction makes them exceptionally strong. They are fast and easy to install. And, their cost is amazingly low.

17" PLASTIC LETTERS **$4.50** • 10" PLASTIC LETTERS **$1.65** • PLEXIGLAS BACKGROUNDS **$2.10**

See THE DIFFERENCE WITH
BEVELITE ALUMINEX POSTER CASES



The attractive new Bevelite case is strongly constructed of one-piece extruded aluminum section. Translucent plastic light shields hold letters for changeable copy. Poster holders are on four sides. Door glass set in Neoprene rubber.





Distributed by
NATIONAL
THEATRE SUPPLY

Manufactured by
THEATRE SPECIALTIES, INC.
7615 Cordova Street
Los Angeles 7, California

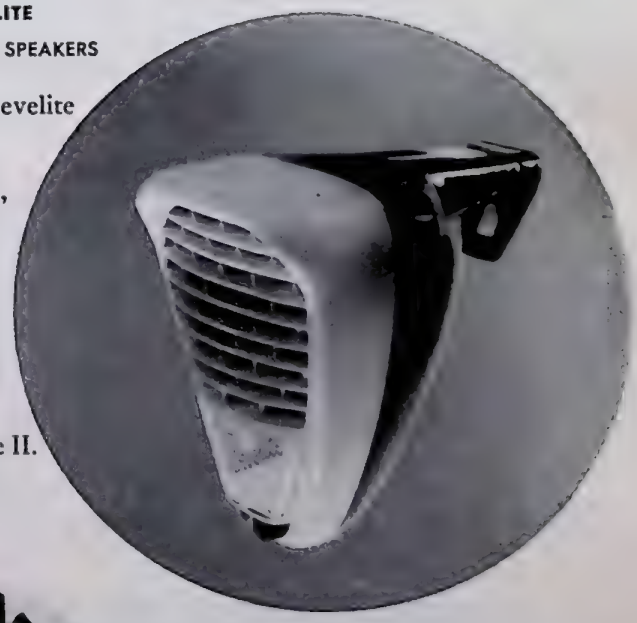
taste THE DIFFERENCE WITH
BEVELITE MOVIE HOUR FOUNTAINETTE

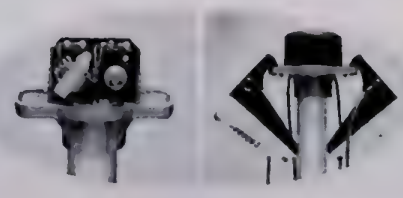


The new Bevelite Fountainette has a compact, all steel cabinet only 22" wide, 21" deep, with access to all moving parts from the front. The new all dry, fully automatic cooling system, no water baths, no ice banks, has amazing capacity.

hear THE DIFFERENCE WITH **BEVELITE**
4" JEWEL-TONE DRIVE-IN SPEAKERS

The superb tone quality of the Bevelite 4" jewel-tone speaker assures complete customer satisfaction, because it has the highest quality, full range sound at all levels. The beautifully designed, all-weather case is constructed entirely of Tenite II, and is guaranteed unconditionally for one year. The junction box is illuminated and also has a downlight. Its base is die-cast aluminum with a cover of Tenite II. Removal of the cover gives easy access to all connections.





INDIVIDUAL BEVELITE 4" SPEAKER	ILLUMINATED JUNCTION BOX WITH DOWNLIGHT	SINGLE POST UNIT COMPLETE WITH JUNCTION BOX AND TWO SPEAKERS
$5.95	**$4.95**	**$16.85**

More Theatres Install Wagner Attraction Panels and Letters THAN ALL OTHER MAKES!

They know that their most effective, lowest cost advertising medium is a Wagner panel which is large enough for plenty of powerful sales copy formed with Wagner letters in a variety of sizes and colors to lend emphasis.

Successful showmen know that you have to sell hard EVERY day — that you can't just wait for the "big ones" to come along. They bill *every* attraction as a big event.



Well-lighted attraction panels, large enough for plenty of powerful sales copy, and enough letters in a variety of sizes and colors to lend emphasis — are getting the business and at smallest cost. You can't sell 'em if you don't tell 'em! Spend your adverising dollars smartly. Invest them in point-of-purchase promotion. Exclusive features make Wagner displays the most popular of all display equipment. Put a Wagner display to work for you. Send today for the BIG FREE CATALOG.



WAGNER STAINLESS STEEL FRAME AND GLASS UNITS

The only frame which affords openings and billing space of any height or length in ONE panel, making it unnecessary to join together a series of small signs. Because of their stronger construction plus the fact that these frames can be installed in the sign without any glass in them and glass installed later, Wagner Window-Type Frames can be built in larger section than is possible with any other design — a vitally important feature with drive-ins where large displays are necessary. Lamps, neon and glass can be serviced without removing the frames.

All parts of the sign may be serviced through open windows. These frames soon pay for themselves by elimination of maintenance costs necessary with any other large frames.



Wagner Sign Service, Inc.
218 S. Hoyne Avenue
CHICAGO 12, ILL.

WAGNER ENDURONAMEL PANELS FOR DRIVE-INS



A high-quality, low-cost changeable copy display for drive-ins. Consist of a series of best-grade, 18-gauge, stamped steel panels, seven inches high, that comprise both the background and letter-mounting arrangement. The uprights are of 18-gauge metal, galvanized after fabrication. The unit also includes an attractive 2" border which is an integral part of the background, and easily attached end pieces. Finished in a newly developed baked enamel which by long, exhaustive tests has proved to be chip-proof, shock-proof, alkali-resistant, and salt-spray resistant. Highly effective by daytime, they may also be illuminated by floodlights, spotlamps, gooseneck reflectors or fluorescent tubes.

WAGNER TAPER SLOTTED COLORED PLASTIC LETTERS



The exclusive new-type, tapered slotting (Pat. Pending) causes the letter to "lock" on the bar and not be disturbed even by high winds. Yet, they're the easiest to change of all letters.

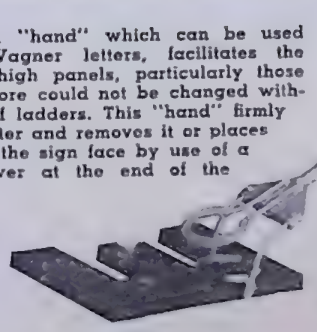
Wagner's slotted method of mounting prevents freezing to the sign. The widest range of sizes and colors. Available in 4", 6", 8", 10" and 17" sizes in gorgeous red, green, blue, amber and black. The non-fading, jewel-like colors go all the way through the letters, hence cannot chip or scale. Furthermore, these strong, durable letters never require painting or other maintenance. Wagner letters are the only plastic letters that can be stacked for storage without danger of warping.

Don't permit a shortage of letters, or old-fashioned letters, to spoil your front. If you have all one size and style letters, get some of the new letters, especially the larger sizes that shout. Wagner has made it possible for you to order a minimum font of changeable letters on your original order and subsequently purchase additional letters for each change of copy until you have an adequate stock on hand. By so purchasing, most of the letters are legitimately chargeable as advertising material for the feature for which they are purchased.

This convenient service, and the important savings which result from ordering only those letters you actually use, is made possible by the establishment and maintenance of ample stocks of letters in leading theatre supply stores in most film centers.

MECHANICAL "HAND" LETTER CHANGER

A mechanical "hand" which can be used only with Wagner letters, facilitates the servicing of high panels, particularly those which heretofore could not be changed without the use of ladders. This "hand" firmly grasps the letter and removes it or places it straight on the sign face by use of a tensioning lever at the end of the handle.



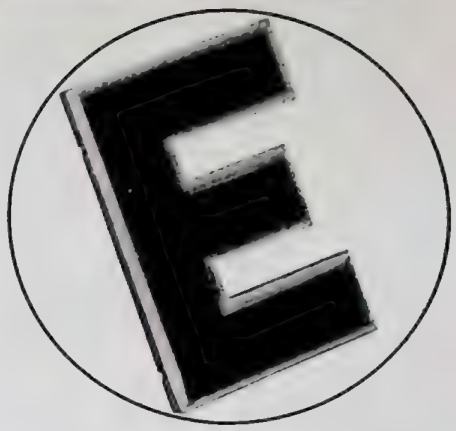
10-ft. length (for signs with top row up to 16 feet) $27.50

14-ft. length (for signs with top row up to 20 feet) $30.00

F.O.B. Oklahoma City.

WAGNER SLOTTED ALUMINUM LETTERS

Wagner aluminum letters are slotted with uniform spacing so that ANY and ALL sizes can be used on Wagner Frames. This is an exclusive, patented feature. Available in the widest variety of colors, finishes and styles and in more sizes than offered by any other line. Solid color, cove letters and colored or aluminum cove-edge letters are made in 4", 8", 10", 12", 16", 24" and 30" sizes. Gothic letters in 6", 8", 10" and 12" sizes, and poster letters in 8" and 10" sizes.

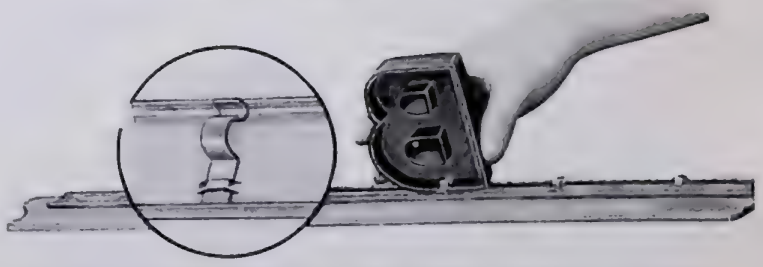


WAGNER FLEX-WORD FRAMES



These miniature frames mount on Wagner Frames and provide for the easy forming of less important words with 4-inch letters. They permit better use of space and made word-plates unnecessary. Letters can be staggered in three lines, or two straight lines can be used in a space that ordinarily accommodates one row of 10" letters. Available for either straight or curved attraction boards, and in horizontal lengths of 8", 12", 16", 20" and 24".

WAGNER COLOR-LITE TRANSLUCENT PLASTIC LETTERS



For indoor use. They pick up indirect lighting, appear to be lighted. 4", 6", 8", 10" and 17" sizes in red, blue. green, amber and black.

These letters can be set up on narrow ledges, and many places where no other display equipment can be used, by means of Wagner stainless-steel mounting strips which have clips for holding letters in position.

Drilled for mounting with nails, or screws onto any cove, sill or other wood foundation, these mounting strips can be placed on a top surface and the letters mounted in the "standee" position, or the strips can be fastened on an under surface and the letters used in suspended position.

Wagner Sign Service, Inc.
218 S. Hoyne Avenue
CHICAGO 12, ILL.

ADLER

The Most Brilliant Name in CHANGEABLE LETTER DISPLAYS!

✱ The *ORIGINAL* "Third Dimension" Letters. Colorful Beauty in 2-Tone "Lok-Lip" Plastic Letters. *GUARANTEED* Cast Aluminum Letters.

✱ Structurally Strongest Stainless Steel Frames. Come Glazed Complete with Glass or Plastic.

✱ *EXCLUSIVE* "Remova-Panel" Frames Save Maintenance Costs.

✱ Low-Cost "SECTIONAD" Changeable Displays; Come Completely Assembled.

●Adler 3D Dimension Plastic Letters

Amazingly strong and tough, yet pliable, with integrally molded lugs for longer life and service. The 2-Tone Plastic adds a 3-Dimensional effect to your signs and makes them easier to read at a distance. **Adler 10" and 17" "LOK-LIP" Plastic Letters** are available in brilliant colors to give your signs ACTION . . . VITALITY . . . and REAL SELLING PUNCH!

●Adler 3D Dimension Cast Aluminum Letters

In 4"-6"-8"-10"-12"-16"-24" sizes (8" to 24" interchangeable on the same frames). **So durable that we GUARANTEE FREE REPLACEMENT** of every Adler Cast Aluminum Letter you break and return. ADJUSTO UNIT available for use of 4" and 6" letters on all frames.

●Adler Frame Units with Glass or Plastic

Made of 18-8 Stainless Steel and reinforced for extra strength and rigidity. Adler Frames are the strongest you can buy; **they are perfect for signs of any height, any length;** curved and mitred frames can be made to fit any opening. DELIVERED TO YOU COMPLETELY GLAZED AND READY FOR INSTALLATION.

●Adler "Remova-Panel" Frames

For easier maintenance in less time. Cleaning, repair and replacement are done anywhere in the sign without lifting out large, heavy frame units. "Remova-Panel" saves its cost in sign maintenance.



●Adler Low-Cost "Sectionad" Displays

This is the most economical Changeable Letter Display. Background is porcelain enameled steel, with Stainless Steel bars positioned to hold letters of all sizes. **Delivered completely assembled in any height, any length;** ideal for Drive-In Theatre approach signs.



For more information about ADLER DISPLAYS, call your distributor or write for FREE CATALOG to:

ADLER SILHOUETTE LETTER CO.

General Offices: 11843 WEST OLYMPIC BOULEVARD, DEPT. TC
LOS ANGELES 64, CALIFORNIA

NEW YORK: 1451 Broadway CHICAGO: 30 W. Washington
Los Angeles—Chicago—New York—Toronto, Canada—London, England

SAVE ON FREIGHT—Adler Equipment is shipped to you F.O.B. Chicago or Los Angeles, whichever is closer.



NO DOORMAN REQUIRED HERE

THE PEREY "Magic Barrier" TURNSTILE SYSTEM

When You Install a Perey Theatre Turnstile you get more than just a machine. You get the benefit of operating your box office efficiently without the ticket taker or tickets.

The Cashier collects the admissions and the Perey Turnstile checks the cashier by means of a register in the turnstile. No tickets are required as the turnstile register automatically counts each patron entering the theatre.

Simple Method of Operation. The box office is equipped with a Perey Theatre Type, Registering, Two-Way Turnstile under the control of the cashier. Patron pays admission charges to the cashier, then passes through the Perey Turnstile which automatically registers his admission. The patron is automatically guided from the box office to the entrance door by properly designed railings located so that the entrance passageway is always under the control of the cashier.

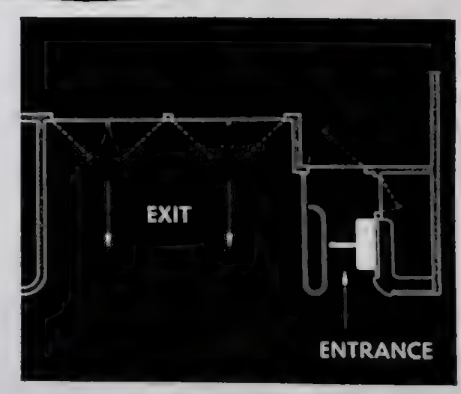
No tickets are required. The turnstile register checks against the cashier's receipts. No ticket taker is needed.

Where Rates Change at different hours of the same day—readings of the register are taken at the time the rate change goes into effect.

When There Is a Price Differential between adults and children—the turnstile is equipped with an extra register for child admissions. In addition, there is an overhead visual indicator which lights up when the child admission is registered, thus checking against any possible manipulation by the cashier of adult and child admission receipts.

Perey Systems Satisfy the Fire Department. Installations of the Perey Theatre Type Turnstiles are in operation in most of the large cities of the country where fire department rules are of the strictest. The Perey Application Engineers design the systems so that there are always as many Exits as required to satisfy the Fire Dept.

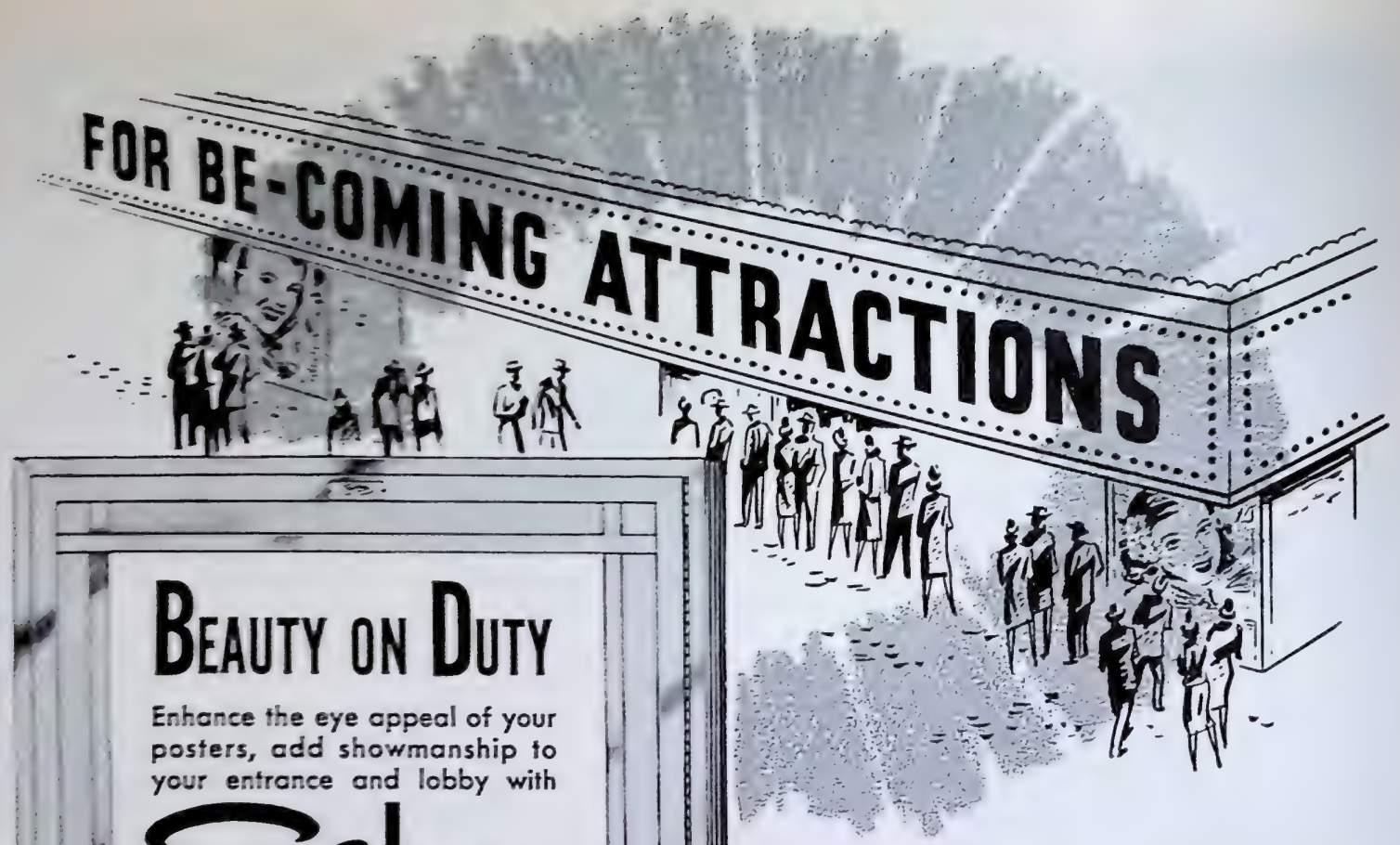
The Entrance is so designed that it takes a minimum of space and is located in such a way as not to interfere with an Exit. In fact, the entrance becomes an additional exit in case of emergency. The Perey Theatre Type Turnstile is always of the two-way passage type, permitting free exit in case of necessity.



An arrangement with cashier booth at side of lobby.

PEREY TURNSTILE COMPANY

106 EAST 41ST STREET **NEW YORK 17, N. Y.**



BEAUTY ON DUTY

Enhance the eye appeal of your posters, add showmanship to your entrance and lobby with

Sealuxe DISPLAY FRAMES

Standard and De Luxe

EASEL AND INSERT FRAMES
BANNER BOARDS
PHOTO AND COMBINATION FRAMES
DOOR AND LOBBY ACCESSORIES

MIRACLES in METALS

Wherever there is a theatre, there is need for SEALUXE theatre Display frames, and other SEALUXE Accessories.

BUILD BETTER BUSINESS
Make your coming attractions more attractive.

EASY TO CLEAN
Permanent alumilite finish needs no painting or polishing. Merely wipe with a damp cloth now and then. No rot . . . no rust . . . no tarnish . . . no corrosion.

NO MAINTENANCE
SEALUXE Display frames have maximum strength and minimum weight. No binding, sagging or warping.

When you invest in Sealuxe Display Frames the First Cost is the Last Cost!

J. P. TRAVIS, *President*

CLIP and MAIL TODAY!

Dept. B-3, UNIVERSAL CORPORATION,
6710 Denton Dr., Dallas 9, Texas

Sirs: Please send me your latest information on SEALUXE Display frames and accessories.

NAME_____

FIRM_____

ADDRESS_____

Universal CORPORATION

6710 Denton Drive, Dallas 9, Texas

INTERIOR *and* AUDITORIUM

1954-55

Supporting and Controlling Wide Screen Curtains

The Problems Involved in Installation of Curved and Straight Track for Wide Screen Curtains are Given With Their Answers

By Abram Samuels
President, Automatic Devices Co.

With the advent of CinemaScope and the general trend toward the enlargement of present day motion picture screens the curtain track and curtain control manufacturers have been faced with a new problem—emphasize curved tracks, or advocate time-proven and reliable straight traverses?

The dilemma was and still is a logical and real one. There is an old geometric axiom which asserts that the shortest distance between two points is a straight line, and the producer of curtain tracks is well aware of the difficulties involved in assuring a smooth and efficient curtain movement involving a curved traverse. From our standpoint, as manufacturers, a production line can be easily maintained with a turnover of straight tracks but we cannot help but feel that there is no such thing as an assembly line with curved assemblies. Further, we cannot be too dogmatic in stating that the less deep the curved screen is, the more reliable and harmonious operation will be effected from the traveler track.

CURVED SCREENS

The warning signal of the growing interest in curved stage layouts had been sounded well in advance of the first Cinerama or CinemaScope showings. For a number of years architects and designers had been slowly abandoning the rectangular, congruent shapes and were accentuating sleeker, more radical deviations. Therefore, following World War II, an increasing number of inquiries relative to curved tracks began flowing into our offices.

We were very fortunate in having an admirably suited heavy duty track assembly to adapt for curved screen use. Our theatre noiseless Silent Steel No. 280 unit was easily converted into a quiet, effortless No. 310 curved traveler and, with rubber ball-bearing carriers rolling on two parallel treads, capable for installations of any length. Then the recent development of Back-Pack guides which served to prevent the curtain from gathering in folds until the curtain reached the track ends, only tended to enhance the new theatrical effect. The Back-Pack accessories also function to decrease the starting load on a motorized track since the guides cause the curtain weight to be evenly distributed to all curtain carriers.

Tests

As we indicated, however, requisitions for curved tracks must be accepted, engineered, produced and tested on an individual order basis. Obviously it is then impossible to maintain the same rate of delivery on this type of merchandise as is customary with standard straight track equipment. There are also restrictions with regard to the extent of the

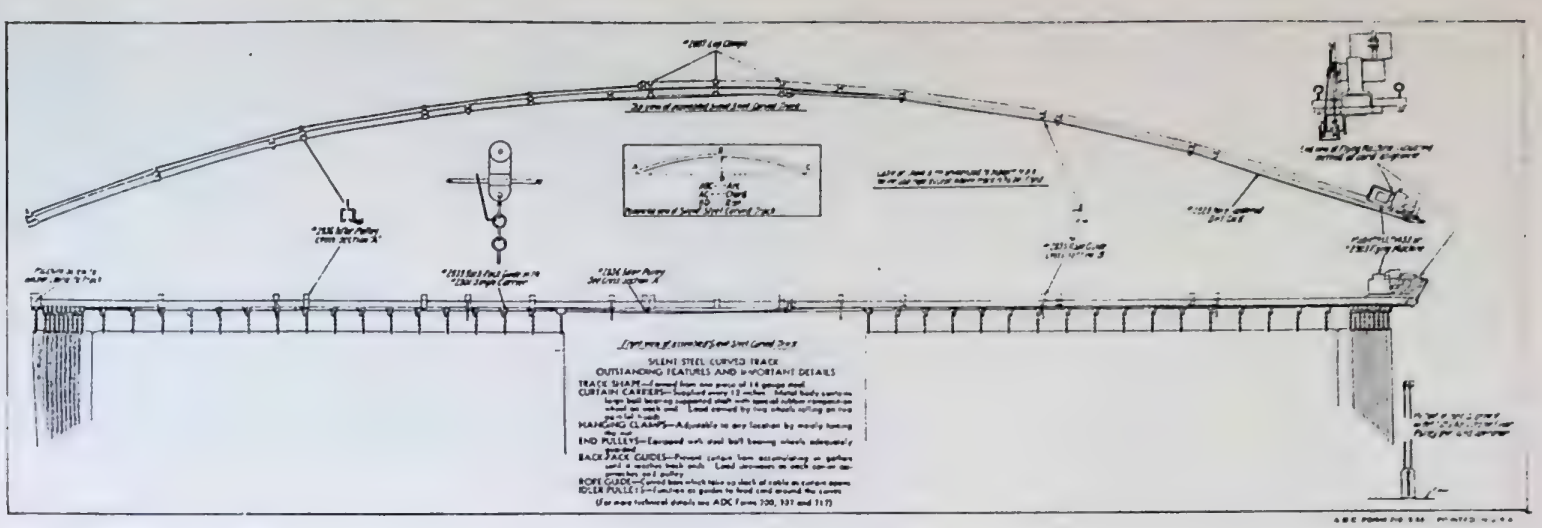
BRIEF: ***Although the introduction . . . and adoption of the wide screen by most segments of the motion picture industry was a much needed . . . and important change for the better . . . it also had the effect of creating many new problems for exhibitors . . . and theatre equipment manufacturers.***

This article attempts to analyze some of the problems and considerations involved in the installation of curtain tracks and curtain controls for the new wide screens . . . Such topics as curved screens . . . straight screens . . . masking . . . the different types of curtain controls . . . are given individual treatment by the author . . . There are many specific examples given to illustrate the problems under study . . . and workable solutions are also offered.

There is an interesting section devoted to theatres with unusual . . . or difficult curtain problems . . . and a number of valuable and specific hints at possible . . . and practical . . . answers are presented.

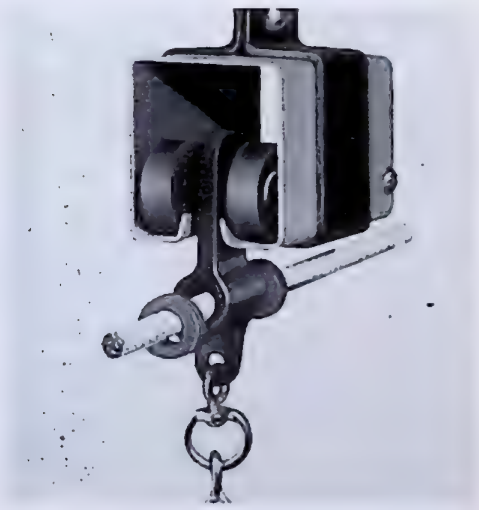


INSTALLATION of wide screen by National Theatre Supply Co., at the Astor, Boston, including ADC No. 310 curved track, and the No. 1452 control.

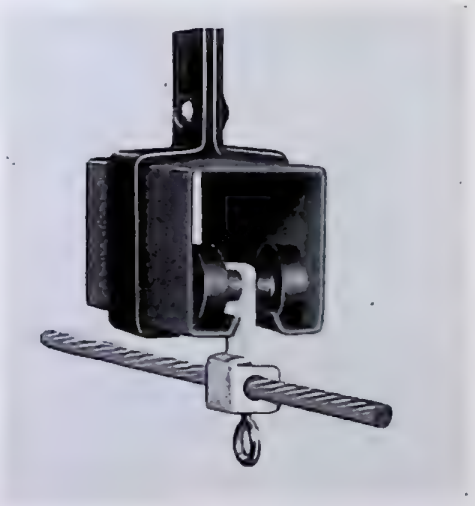


SEEN HERE is a panoramic view of the No. 310 curved track. You will note that the arc, the chord and the rise are clearly indicated here.

curve on a particular job. For example, as a result of exhaustive tests made at our plant we have found it impractical to accept jobs where the radius of the curve is less than 33 feet, or where there is more than one radius on an individual traverse. The latter condition poses a complicated problem because the structure of many of the prosceniums in



SEEN IS A section of the Silent Steel track and carrier assembly. Requires less packing space.



A SECTION of the Besteel track and carrier assembly. It is now available for curved screens.

our nation's theatres make it mandatory that the curved track parallel the side walls, which of course means a comparatively sharp turn near each track end as the side walls are approached. With our principle of two balanced wheels rolling on two parallel treads one can understand our apprehension as the carriers approach and roll along such incongruous curving. What happens is that the cord is trying to move on a straight bias and this tension naturally causes our balanced carriers to buckle and foul. One solution to this problem would be to cut through the side walls to assure one consistent radius; however, this is more often than not both economically and structurally inexpedient. Oftentimes an overhanging balcony prevents the allocation of sufficient space for continuation of the curved track.

By the term radius we mean the straight line drawn from the center of a circle to the outer surface of the circle. It is sometimes possible to find an installation where the curve radius is well beyond our 33 feet minimum but the curve is still too sharp for us to guarantee a satisfactory operation. As an example, if a horizontal line were drawn between two hypothetical curved track ends, let us assume that line measures 60 feet long; if a line were drawn between the center of that point to the center of the curved track, let us assume it measures 20 feet. This would indicate that the former figure (60 feet) is three times the latter figure (20 feet). However, as a result of tests made at our plant we have found it infeasible and inadvisable to accept jobs where the former figure (called the Chord) is less than three and one-half times the latter figure (called the Rise).

In connection with curved tracks our employees are now well versed in using such terms as Rise, Chord, Radius and Arc (represented by the curved track itself). Particularly the Rise and Chord are essential dimensions to be furnished for proper processing of curved track orders. Certain formulas involving these dimensions have been devised, the most useful one being where the Chord and Rise are known and where the Radius must be ascertained:

$$\text{Radius} = \frac{(\text{Chord})^2 + \text{Rise}^2}{\left(\frac{2}{}\right) \times \text{Rise}}$$

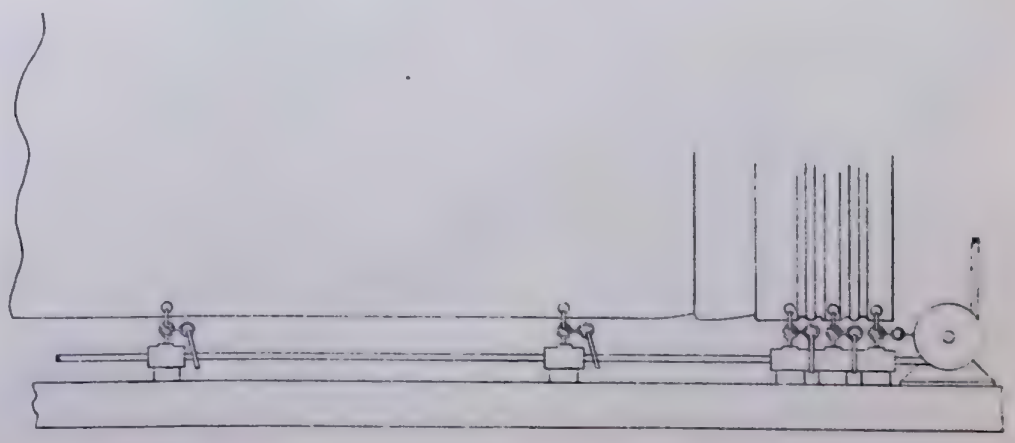
Given a Chord of 40 feet with a Rise of 24 inches, a typical CinemaScope installation, what would be the Radius?

$$\frac{\frac{(40)^2 + (2)^2}{(2)}}{2 \times 2} = \frac{400 + 4}{4} = 101 \text{ feet}$$

(well above our minimum figure)

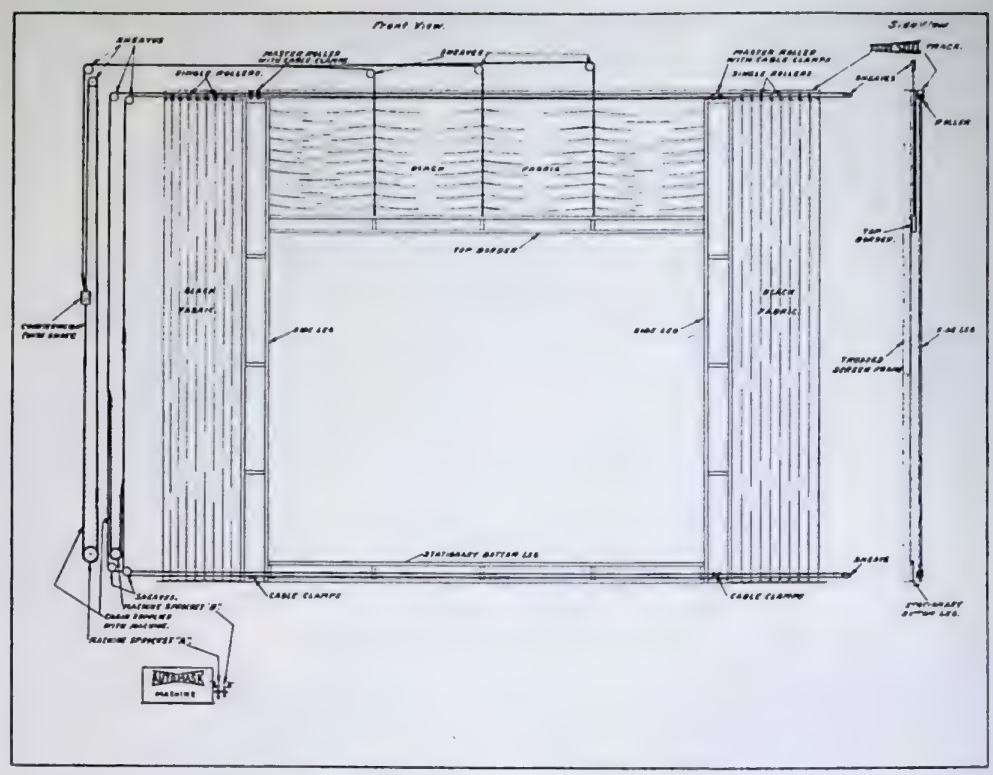
With the Radius definitely established along with the Rise and Chord it is then possible to proceed with the fabricating and forming of the curved channel.

Also available now is a curved track traveler. The carriers furnished with



A DRAWING of the recently developed backpack guides and the method of attachment used.

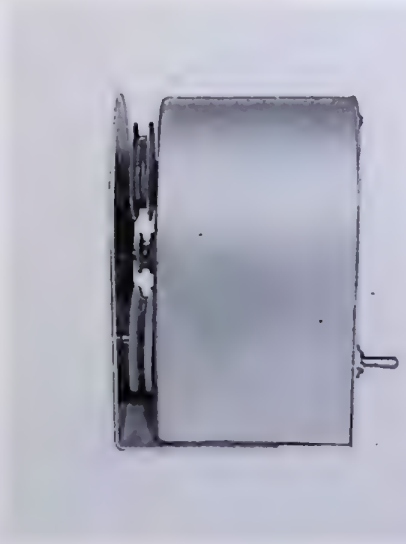
A DRAWING of a typical Magnascope installation. There were available 25 years ago, and might be practical for use with today's screens.



assembly utilizing our popular Besteel this track are of nylon ball-bearing construction and therefore require no lubrication. The use of nylon minimizes abrasion, provides high corrosion resistance, and assures the carrier of a longer life. A bearing is included in the hub of each of the two wheels in the carrier. The advantage to using this track over the Silent Steel model is that less packing space is required. One of the chief drawbacks with regard to a new wide screen installation, centers around the fact that most wide screens take up almost the entire proscenium space, leaving very little side wall room for the packing of the curtain when it is open. Each Silent Steel carrier measures a little under two inches in width which means that on a 40 foot track each 20 foot curtain section has to be allocated approximately three and one-half feet to accommodate its packed fabric. With Besteel, however, the width of the carrier measures only one inch and on such a 40 foot track less than two feet would be needed for packing space.

STRAIGHT TRACKS

Again, from a practical standpoint and considering both the theatre and the dealer who makes the installation, we unqualifiedly would prefer that theatres put in screen curtains supported from straight draws rather than curves. Certainly from a cost point of view it is far less expensive to purchase and install a straight track produced from an assembly line than to put in especially fabricated and relatively high priced curved equipment. Of course we, as manufacturers, do not effect as high a sales figure on a straight track transaction, but on the other hand the user has a foolproof assembly, not to mention the less time it takes to make delivery. For instance, where it might take one man hour to process a 40 foot straight track through our plant, it would actually take about 10 man hours to produce a 40 foot curved track depending of course on the Radius. In all fairness to the enthusiastic adherents of a decorative and distinctive-looking stage there can be no question that a screen presentation is definitely enhanced by the presence of a traveler which follows the curved contours of the wide screen.



SIDE VIEW OF THE Tom Thumb curtain machine. This minature mechanism was recently introduced.

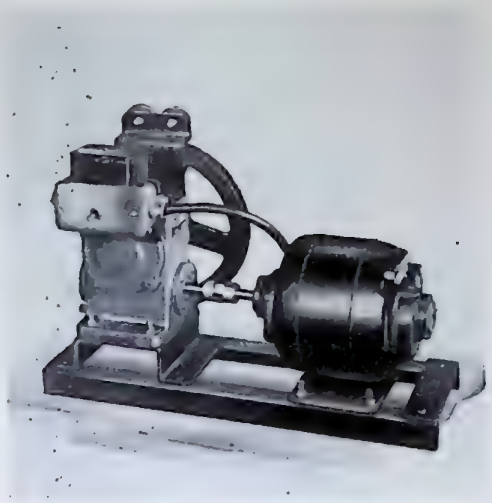
In defense of straight tracks over and above the fact that they are lower priced and easier to make, it is interesting to note that especially with some CinemaScope screens the actual screen curvature is so slight that a curved screen curtain paralleling it would in all probability be unnoticeable in its curved form anyway. In this connection we read with interest recent articles in the trade journals which stated that a flat CinemaScope screen installed in Radio City Music Hall has presented CinemaScope on a flat screen without any tilt . . ."

Enlarge Front Curtain Track

Where the theatre owner is concerned about an excessive outlay of money in order to convert to a screen reflecting an illusion of depth, he may well consider enlarging his front curtain track which can easily be done with minimum expense, equipment, and labor. By the use of splicing clamps a straight track measuring, for example, 40 feet can be widened to 60 feet by purchasing two 10 foot channels, two pairs of hanging clamps, 10 single carriers and two pairs of splicing clamps. The end pulleys must be removed from the present track ends and attached to the respective 10 foot channels following which the cord must be rethreaded through all of the carriers. The installer must make certain that the extension channel is lined up properly with the section to be joined and that the splicer fits properly to each end. In this way track conversion costs



SCREENS may be enlarged easily by making use of splicing clamps as illustrated in this picture.



THE MANUALLY operated machine, which is ideal for use in the small theatre with need for economy.

are held to a minimum and the theatre owner is assured of a simple extension to an already satisfactorily operating unit.

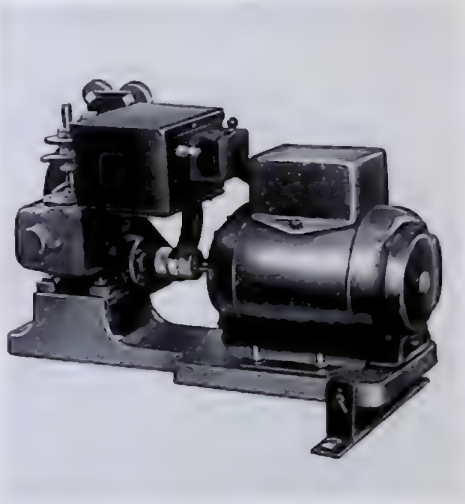
Masking

Today's new screens present new masking problems. Twenty-five years ago there was somewhat of a demand for a screen masking regulator called Automask which provided automatic control of what was known in the trade as a Magnascope arrangement. Due to the wide spread interest in versatile screen enlargements, Magnascopes have again been mentioned as plausible solutions for wide screen maskings. Therefore, these Automask apparatuses with appropriate sheaves are again obtainable for such usages.

A common method of side masking for today's screens is the employment of "side-leg" tracks. Let us assume, for example, that the wall-to-wall proscenium opening is 50 feet and that the screen size for the ordinary 4 to 3 picture is 30 feet. In order to accomplish side maskings it would be necessary to have a 55 foot stage curtain track in two 27½ foot sections (the extra 5 feet reflects approximately an additional 10 per cent to accommodate center overlap) as well as two 10 foot legs which would be installed in front of and parallel to the 55 foot track. Assuming that this job was to be machine operated a heavy duty curtain control with limit switches would be required to operate the 55 foot track and a light duty controller with limit switches to operate the legs. In this connection we recently introduced a miniature mechanism called Tom Thumb which was especially designed and planned for such masking applications. This is the smallest and most inexpensive theatre curtain control available complete with limit switch arrangement allowing for pre-set stops. The popular stop, start and reverse feature is embodied in the mechanism and an extra push-button switch is included for remote control from the projection booth.

CURTAIN CONTROLS

This now brings us into the realm of the curtain control and its new role in the wide screen picture. Curtain controls have been synonymous with curtain tracks ever since the motion picture theatre came into prominence. The obvious advantage of automatic control to the hand operation of a stage curtain is actually a matter of convenience. There can be no denying that from an economic standpoint it is much less expensive to manually operate a curtain rather than purchase a motorized unit. With today's stress on various size screen openings, however, it becomes somewhat difficult to depend on the hand of the curtain operator who is compelled to stand at the floor pulley side of the stage to move the curtain to its proper location each time the screen is changed in size. It is necessary that the curtain be moved to various positions several times a day and the angle from which the stagehand pulls the cord does not lend itself for assuring an accurate lining up of the curtain to the desired screen ratio. When side legs are used the problem becomes more pronounced. While the curtain machine is often placed on the stage floor underneath the live track end there can be no doubt that the most efficient and time-saving method of operation is in the booth where the projectionist has the screen panorama directly in front of him and has every control of the curtain at his fingertips. In this way he is able to approximate curtain openings and closings much more precisely.



THE SINGLE button stop, start and reverse machine a medium priced curtain control.

It has only been in the past year or so that a number of diversified automatic controllers have appeared on the market. On stages where it is necessary for the screen curtain to move from one track end to the other the standard curtain machine with limit switches can be used. This limit switch arrangement provides a set of "knock-off" levers which, when properly adjusted, enable the motor to shut off at two prearranged stops—one at the overlap area of the track, the other at the pulley ends.

Depends On Operator

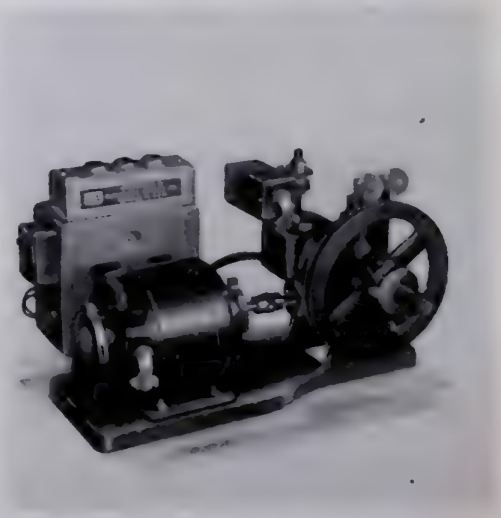
The current interest in curtain machines has been directed, however, toward a more advanced and specialized unit furnished with the "stop, start and reverse" feature. Here is equipment which can be stopped, started, or reversed at any point along the travel, and, of course, this ties in perfectly with the new screening techniques. It is important to bear in mind, however, that the control of all curtain machines is basically dependent on the eye of the operator with regard to the time when and point where the curtain is to be moved or stopped. The extent to which the eye of the operator is important depends on the screen sizes to be utilized during a particular showing. For example, if the feature film is in CinemaScope and the short subjects in 2-D, at the time when the feature is about to go on the curtain operator must be able to precisely and accurately move the curtain to its full open position; conversely, between the end of the feature and the beginning of the shorts he must be able to judge, by the human eye, where the exact location of the curtain is to be to assure only enough screening for a 4 to 3 ratio. The only plausible way of eliminating the necessity of depending on the operator's eye for such control would be to tie in the curtain's operation with the running of the film itself through the medium of a timing device. At the present time such a system has not been developed for common use.

Types of Machines

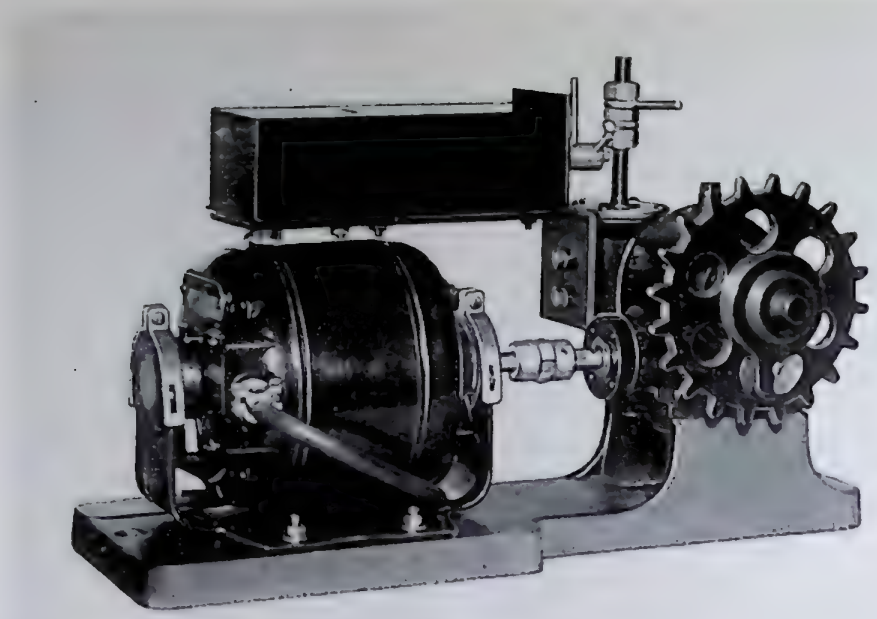
There are several types of stop, start and reverse machines being made and we will briefly discuss the fundamentals of each. Listed in the order of the lowest-priced unit first they are as follows:

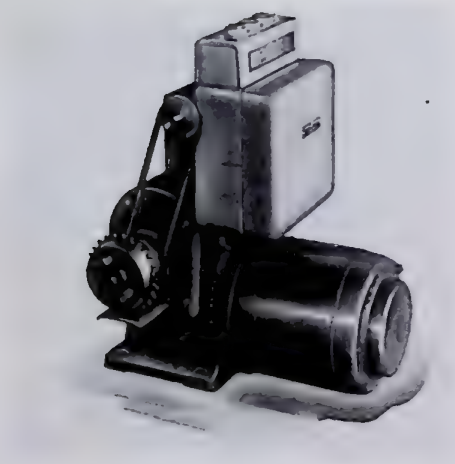
1. Manually Operated (without limit switches).
2. Single Button (with limit switches).
3. Three Button (with limit switches).

Each one of the foregoing controllers is manufactured in ¼, ⅓ and ½ horsepower models. Each can be secured with various ratings and an extra switch for remote control is furnished at no extra charge. An overload protective breaker is included and functions to protect the motor against accidental overload. The curtain speed varies according to the size driving wheel attached to the gear shaft. There is a valuable axiom that



THE MOST elaborate of the curtain control mechanisms is the three button stop, start reverse.

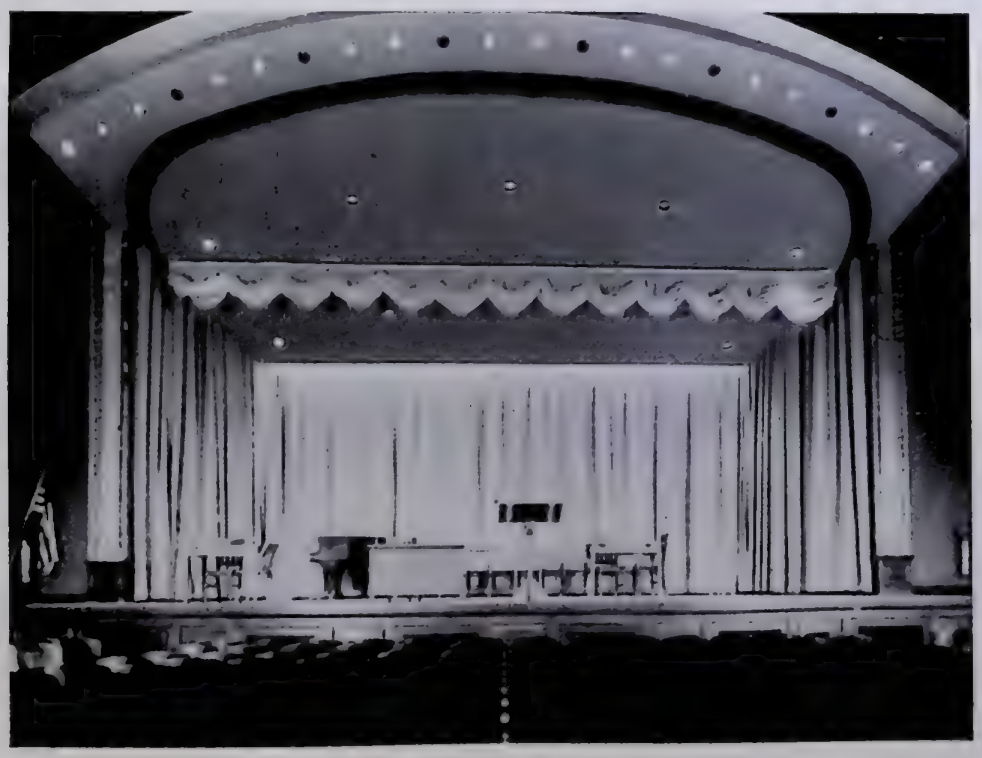




SPROCKET machine (top) A Hercules lift machine (above) A Novelty Scenic installation (below).

should be borne in mind in this connection—the larger the wheel, the faster the speed, the less the power. The average speed for ¼ and ⅓ horsepower machines is about 90 to 100 feet per minute equivalent to a curtain separation speed of three to three and one-third feet per second. For a ½ horsepower machine the speed is usually between 140 to 155 feet per minute equivalent to curtain separation of four and one-half to five feet per second.

The manually operated machine is the answer to the small theatre owner's dreams for an economic utility model which can perform the same basic functions as the higher priced units. Here is without doubt the most inexpensive curtain machine that can be bought for use with various size screens. It is not automatic in operation and the booth operator must hold his finger on the toggle switch as long as he desires curtain movement. As soon as he lifts his finger the machine will stop. He can stop, start or reverse the curtain at any point along the travel, but since no limit switches are equipped on the apparatus, he must judge for himself the exact position along the travel where he wishes the curtain to stop.



The single button stop, start, and reverse unit represents the medium-priced range of curtain control equipment for wide screen use. Furnished with limit switches and a sequence type relay the operator needs only to touch the control button in order to effect change of direction. This machine differs from the manually operated unit in that it can be set to stop at a predetermined position, usually at the pulley end and overlap end of the track. In order to stop, start, and reverse the machine in between these areas the operator must of course be vigilant and press the button at the precise points where, and times when, it has previously been decided upon to do so.

The three button machine is looked upon as the Cadillac of the draw curtain controls. Here is a highly specialized and versatile unit upon which is mounted a magnetic starter and a control station with three buttons—one marked "Stop," one marked "Start" and one marked "Reverse." While on the surface it might seem that the single button model described above would be the easiest and least time-consuming to use, actually the opposite is true. By illustration we will make a typcial comparison.

Let us assume that the booth operator faces a closed curtain. He desires to open the curtain to show short subjects with a 4 to 3 screen ratio and then plans to expose his entire wide screen for CinemaScope. With the single button controller the following push-button sequences are required:

1. Press button twice to start curtain movement.

2. Press button to stop curtain at predetermined 4 to 3 location.

3. Press button to reverse motor.

4. Press button to stop the reverse movement.

5. Press button to continue curtain movement to end of travel (CinemaScope exposure).

6. Machine automatically stops at preset stop at track end.

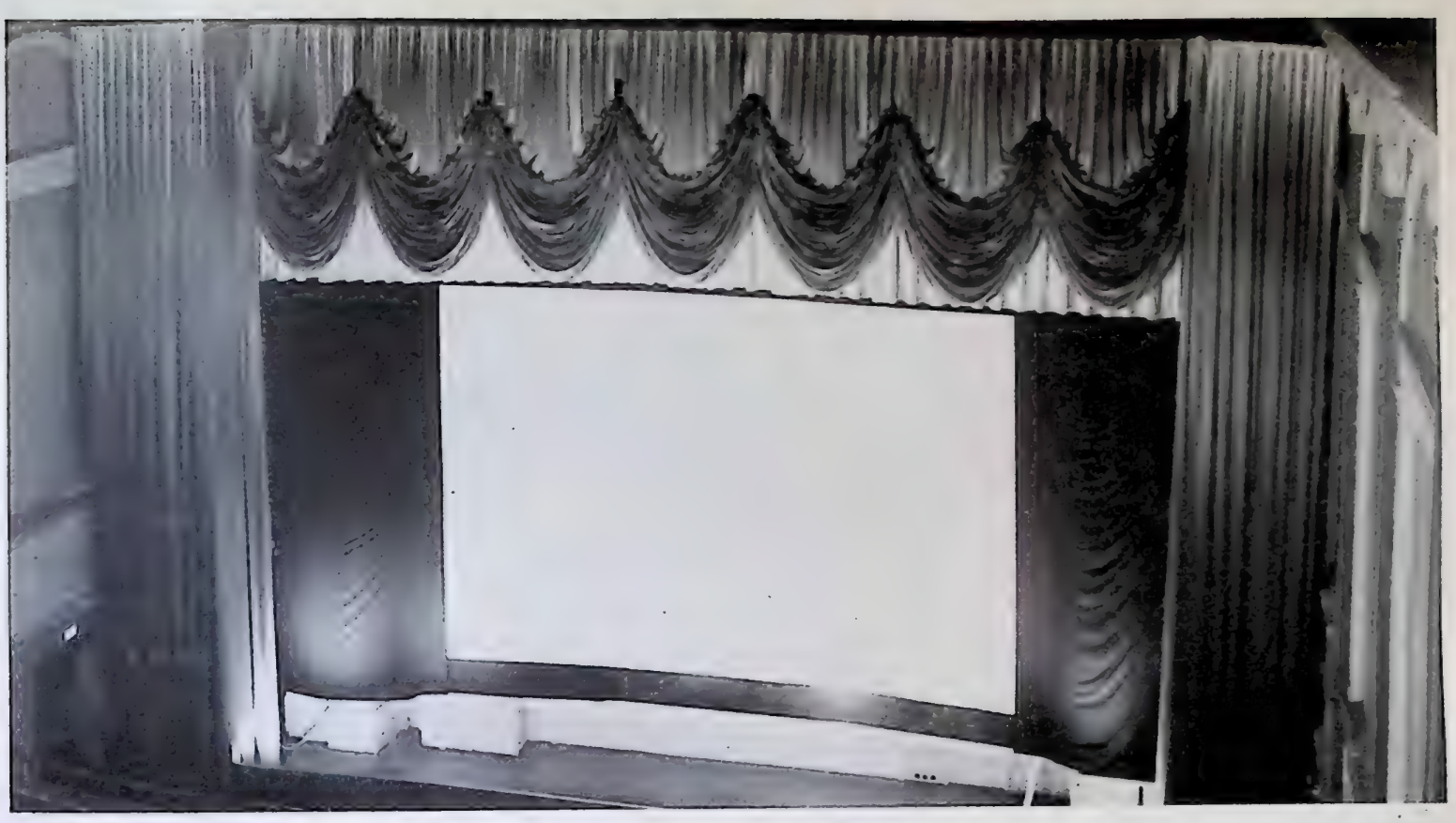
The following steps are necessary for an identical series of motions using a three button controller:

1. Press "Start" button to begin curtain movement.

2. Press "Stop" button to halt curtain at predetermined 4 to 3 location.

3. Press "Start" button to continue curtain movement to end of travel (preset stop) where it will automatically shut off.

Of course, it goes without saying that a certain amount of guesswork must be used in connection with all of the various types of stop, start and reverse mechanisms described above, and this will continue to be the case until such time as a workable low-priced timing

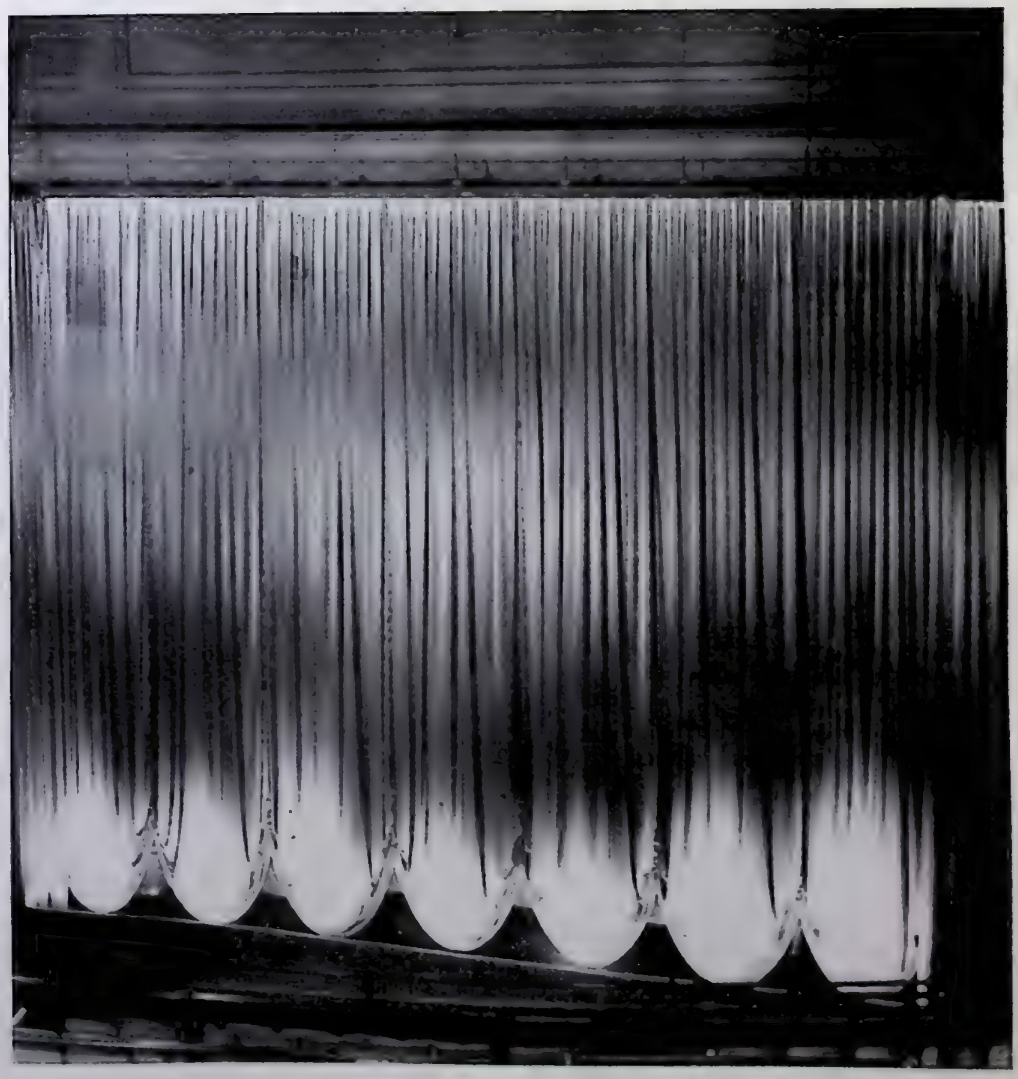


CONTOUR curtain at State, Raleigh, N. C., installed by Wil-Kin Supply Company. the installation includes the ADC Hercules lift machine. These lift machines can elevate curtains of any weight up to 500 pounds dead weight. By using counter-weights, curtains of any weight can be lifted electrically.

device can be employed so that it will not depend on the operator to decide when and where the curtain control switch must be applied. A step in this direction is reflected in the recent development of an accessory called a "latch-in relay." In the example cited above the addition of this unit would provide for an extra pre-set stop—at the curtain location for a 4 to 3 showing. The machine would automatically stop at that set position and when it was desired to move the curtain to expose the entire wide screen, the "Start" button (using the three button model) would be pressed. However, as inferred, only one additional stop would be afforded with this special relay.

Another possibility exists for those who insist on more than two automatic stops. This involves the placing of limit switches on the track itself. While such a system is entirely feasible and affords an opportunity to have an unlimited number of pre-set stops, it has its drawbacks principally because of the prohibitive cost of installation and adjustments. Also there is always the problem of what to do with the wires extending from the limit switches on the track not to mention the necessity for the stagehand to climb a ladder and set the limit switches on the track itself each time a new movie involving a different screen ratio is presented.

One other track arrangement bears mentioning. Where a wall-to-wall proscenium track is used for wide screen showings and where it is impractical for the booth operator to have to control desired curtain positions by eye, it is possible to incorporate an arrangement



THE BEAUTY of the State contour curtain can be seen in view which shows it completely closed.

utilizing two different screen ratios by installing wing or leg tracks for masking. For example, let us assume the proscenium opening measures 60 feet to accommodate a typical wide screen and the screen size is to be condensed at various intervals in order to reflect standard 4 to 3 short subjects. A heavy duty track would be used to support the main curtain and a masking track would be installed with each section in back of and parallel to each end of the main track, but just in front of and parallel to each end of the screen frame. Each section of this masking track would be only as long in length so as to produce, with its closed curtain, the 4 to 3 effect. With this method curtain control guesswork is eliminated because each track is controlled by one standard curtain machine (not of the stop, start and reverse type) with limit switches pre-set for stopping the curtain at each track end.

CONTOUR CURTAIN

A number of our nation's theatres are so constructed that practically no type of curved track can be satisfactorily used. This is due to the unique structure of the stage. The proscenium arch is often laid out in such a way that the curtain track would have to veer sharply so as to be able to clear and parallel the sloping side walls. Then frequently the screen itself has to occupy all available space in the proscenium area allowing no room for a draw-type curtain track. In such cases where there is sufficient height a lift or contour type curtain is the only practicable answer. Since an adequate lift curtain installation vitally depends on a proper stage rigging layout we will dwell only with its automatic control. This type of machine is equipped with either a ½ or ¾ horsepower motor, magnetic starter, three-button control stations, and has a positive drive which produces an elevator type traction effect. This is accomplished through the use of sprocket and roller chain which assures maximum power without possibility of slippage. Lift machines can elevate curtain weighing up to 500 pounds dead weight. With the use of counterweights curtains of any weight can be electrically lifted. The speed is approximately 50 feet per minute equivalent to curtain separation of about one and one-half feet per second. Lift controllers are supplied with the three button stop, start and reverse attachments and include all features of the standard curtain controls. They are also obtainable with brake motors.

Additional Equipment

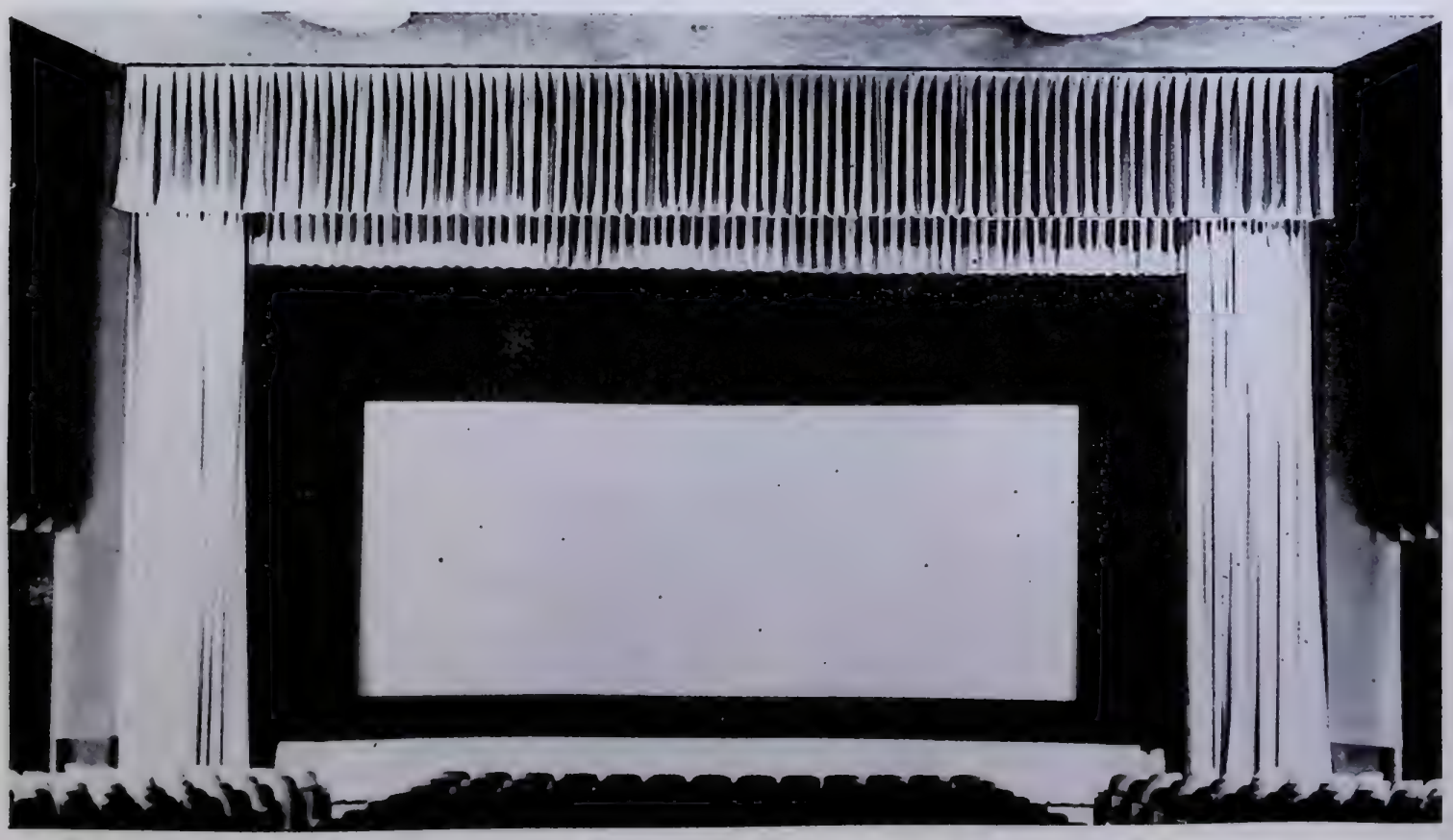
We have briefly outlined the main characteristics of the principal curtain controls now in demand for new wide screen installations. Supplemental equipment is obtainable with all of these mechanisms and depending on the peculiarity of the particular stage either or all of these accessories can be put to good use. All curtain controls, for example, can be furnished with sprocket and chain drive instead of the normal V-drive pulley and wire-centered cord. However, for draw curtains positive drives can only be applied where the height from floor to track is greater than ½ the track length. With raised curtains an appropriate lift machine should be used but very often our standard controllers with sprocket attachments are substituted (contrary to our recommendation and guarantee). In such cases the job must be accurately and properly counterweighted. The motivation behind the use of sprocket and chain on a curtain control is to prevent cord slippage and avoid overtravel. However, most curtain machines are provided with a hinge which elevates the apparatus at one end thus assuring sufficient cable tension.

Another accessory is known as the flying machine. This is nothing more than an attachment of the curtain machine to the track itself by use of special brackets. As manufacturers we prefer to see our curtain controls mounted on the stage floor rather than raised out of reach. Obviously, a problem presents itself should there be power failure in the theatre which would necessitate hand operation of the curtain. While all curtain machines can be easily converted to hand operation by disconnecting the clutch included on each machine, the clutch is of no value when the machine is not within easy reach. The main advantages to "flying" the machine are to clear the stage of obstructions or where there simply is insufficient back-of-stage floor space.

CONCLUSION

One can readily deduce that as far as choosing the proper curtain track and control for a new wide screen installation it is simply a case of "paying your money and taking your choice." A well-integrated and diversified line of merchandise is available for the asking. For the would-be purchaser of equipment whose function it is to beautify and embellish the screen presentation a wide variety of track and control combinations can be had to fit the specific need and obtain the desired theatrical effect.

ANOTHER fine example is the Novelty Scenic Studio installation at the Midway, Forest Hills.



Lounge Luxury

Luxurious Lounge Areas are an Important Feature of Today's Modern Motion Picture Theatre Architecture

By Barclay Adams
Executive Director, American Society of Interior Design

BRIEF: ***One area of the theatre which is getting a new emphasis is the lounge . . . It has become very evident that the average movie-goer no longer will immediately take a seat in the auditorium . . . but will wait in the lounge until the feature goes on . . . The author puts forth the supposition that this is the result of habits formed while watching television at home . . . Another result of home TV viewing is that the public has grown accustomed to comfortable surroundings . . . In all of these things the lounge plays an important role.***

This article goes into detail about the various ways in which the theatre lounge may be decorated and furnished in a manner that is in keeping with the desired mood . . . The subject of proper floor covering materials . . . wall coverings . . . and color schemes are given thorough treatment . . . The article also is so arranged that the intimate art house . . . the large center city theatre . . . and the neighborhood house . . . are each given individual treatment . . . since the requirements and end results of each are different.

Radical changes in theatre design and decoration currently are taking place. Theatres are being designed today with patron satisfaction and comfort as the dominant theme of their planning, a trend that especially is marked in the luxurious waiting space provided by commodious lounges of contemporary design and appointments.

Whether new or remodeled, whether intimate art theatre, center city palace, or neighborhood house flanked by suburban shopping district stores, modern theatre construction is demonstrating an acute recognition of the boxoffice importance of optimum ease and pleasant surroundings for patrons. As never before, theatres are being built with a purpose.

Demand Luxury

Conditioned, no doubt, by television viewing in the relaxed atmosphere of their homes, today's motion picture theatre patrons demand the utmost in comfort and enjoyable surroundings, created by well planned design. Profit-minded management is recognizing this important trend in public taste and recreation pattern, a development of the last half dozen years. It realizes that the great majority of today's patrons insist on waiting until a show starts anew, rather than be seated in the auditorium during a picture.

Sumptuous lounges are being installed to meet this special, sharply defined need for catering to the comfort and mood of a waiting public, and to help offset competition from other forms of entertainment. New decorative media and some interesting new uses of long-established materials are being utilized to provide comfort and beauty that function with a maximum of efficiency, yet keep maintenance and replacement costs at the lowest possible minimum.

Since the lounge, in comparison with other parts of the theatre, such as the auditorium, is constantly lighted, unusual and eye-pleasing treatments of its facilities are of major importance. Real opportunity for tasteful use of color and design is offered. Walls, ceiling, floor, draperies, seating and lighting effects must be correlated for greatest attractiveness and functionalism.

USE OF COLOR

Leading specialists in theatre design and decoration agree that color, properly used, is one of the greatest factors in creating an atmosphere of relaxation in theatre lounges. A feeling of grace and luxury, of freshness and pleasure can



THE LOBBY OF the Fine Arts Theatre lobby, New York, demonstrates how tasteful decoration can increase patron appeal, and create proper mood. The importance of this mood can not be ignored.



COMBINING LUXURIOUS comfort and beauty, the lounge of the Fine Arts has one wall painted soft green, the others a warm terra cotta shade. Floor covering is gleaming verde antique asphalt tile, glossy black marbelized in white and green. Furnishings feature Spanish brown tweed, plants and flowers.



MEZZANINE LOUNGE of Fine Arts (above) has flame-proof asbestos and cotton traverse curtains. The ceiling is black painted acoustic tile with flush lights. Airy wall and stylized map (below) tells the story of the history of communication in this Trans-Lux theatre. Furnishings harmonize with wall decor.

be induced by tasteful use of color, they say. Most important of all, perhaps, skillful handling of decorative color can help put the audience in a mood to enjoy the entertainment they are buying.

Sets the Mood

Color can help maintain the atmosphere of intimacy desirable in the small art-type house, which usually operates on a long run policy. It can give great glamour to the big and spectacular midtown motion picture palace. In neighborhood houses its value in creating a friendly air without sacrifice of prestige or importance cannot be overestimated.

A famous interior decorator, who has done extensive psychological research on the emotional effects of different colors on human beings, says he is convinced that color profoundly affects their emotions and unconsciously shapes their attitudes.

A drab decorative ensemble, he warns, has a depressing emotional effect, tending to make people depressed or resistant. Conversely, a light, airy, colorful decor has a cheerful, relaxing effect, inducing at attitude of receptivity.

Modern decoration employs color-dynamic principles, this authority says. This means the use of a light or dark color value on one lounge wall as accent for the color of the other three walls, or using sharply contrasting, but harmonious, colors in combination with each other.

Floor Decoration Important

The modern theory is that the decorative plan for any interior should begin with a decision regarding the material and color of the floor. The right floor covering for a theatre lounge must meet a number of definite and exacting requirements. Its color must be pleasing, the floor must be easy and restful to walk on, it must be resistant to slipping, with a non-porous and perfectly smooth surface to shed dirt, resist stains, be easy to clean and inexpensive to maintain. Because of its use by many persons, in all kinds and degrees of weather, the floor must be extremely durable.



An outstanding example of how color in furnishings can make a theatre of limited size an attractive showcase from both a functional and esthetic viewpoint is demonstrated by The Fine Arts, an art theatre catering to a select, discriminating New York City patronage.

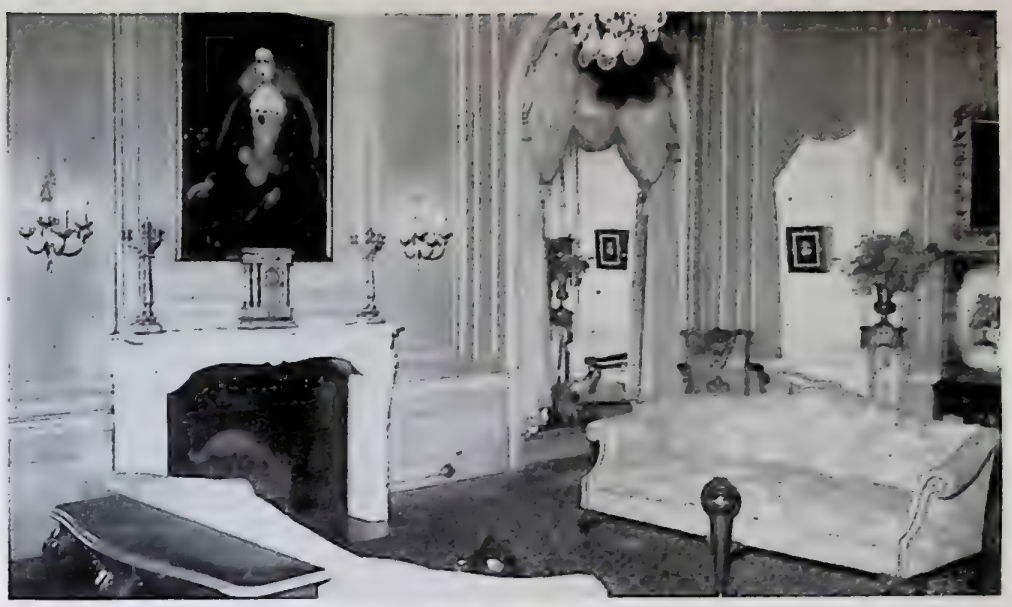
Designed by Simon B. Zelnik in the compact four-level building formerly occupied by a night club, The Fine Arts is intimate in character with a seating capacity of approximately 500. Operated on an art policy, patron service is exemplified in numerous ingenious ways behind its simple modern facade.

INTERESTING EXAMPLES

Notable among the theatre's architectural features is the roomy lounge space provided, both on the loge floor and below the auditorium in the former night club kitchen area. A varied color treatment was employed to add gaiety and mental relaxation to these lounges with furnishings reflecting extreme thoughtfulness for the comfort of the theatre's fashionable East Side patrons.

A unique treatment of ceiling and windows along one entire wall make the smaller mezzanine lounge appear much larger than it actually is. The acoustical tile ceiling is painted black with flush inset lighting fixtures. Flame-proof asbestos and cotton traverse curtains of beige with a bold stylized black and terra cotta pattern drape the big windows. The room is floored in dove gray, echoing the auditorium and foyer walls. Furnishings include numerous contour chairs of black painted or bleached blond wood, and conveniently placed tables with generous sized ash trays.

The main lounge is reached by descending shallow stairs leading from the foyer entrance. Choice of colors here depended upon the fact that the room, 15 by 36 feet, is windowless and artificially lighted at all times. Marbleized verde antique Kentile asphalt tile was selected for the floor, thereby accomplishing several purposes. The marble-like green and white veining of the black asphalt tile simulates the effect of marble, used in the adjoining powder room and currently very popular as a smart decorative material.



SOFT, DELICATE colors are stressed in the lounge of Loew's Kings, Brooklyn, N. Y. Walls and ceilings are in soft beige, with white marble French fireplace and oil painting as focal point of the room. Draperies are rose, and lights include an elaborate French crystal chandelier and wall brackets.



THE LOUNGE OF Loew's Valencia, Jamaica, N. Y. (above) is a reproduction of the great hall of a medieval Spanish castle. Gay colors create an air of spaciousness and festivity in mezzanine lounge of Loew's Metropolitan, Brooklyn (below). Creamy beige ceiling and wall set off by elaborate panels.





THE MODERNISTIC FRONT of the Little Carnegie, New York, creates a mood of sophistication and it is important that the lounge areas of the theatre are so decorated and furnished so as to enhance this mood.

The asphalt tile was laid directly on the concrete floor, which is below grade. It is grease-proof and waterproof, giving an air of underfoot luxury to the lounge. Best of all, according to Harold Spero, manager of the theatre, re-decorating costs of the floor have been eliminated and an occasional waxing maintains its high style colors and brilliance so the tiles look as new as the day they were installed.

The entire wall opposite the room's entrance is mirrored in plate glass, adding spaciousness to the lounge. Another large plate glass mirror is centered on one side wall, which is painted a soft, restful green. Warm terra cotta paint was used on the other two walls and to highlight the interior of a telephone niche. The soundproof ceiling is a rosy beige with indirect flush lighting fixtures.

Warm Spanish brown tweed upholstery covers three luxurious divans, each large enough to seat four persons comfortably on deep foam rubber cushions. Several upholstered armchairs provide additional seating space.

Among the interesting accents used in the lounge is a large round white marble top coffee table, with delicate black veining and black iron legs. Two black-topped lamp tables support a pair of large reading lamps with black bases and rose-beige shades. These lamps and an indirect floor lamp of aluminum add a soft glow of richness to the elegance of the decor. Gleaming aluminum urns, sand-filled for safe disposal of cigarettes, large glass ash trays, half a dozen plantings of flowers and leaves, and a modern black tiled drinking fountain are other well planned features of the lounge.

An indirectly lighted terra cotta colored column rising from floor to ceiling has been made into one of the focal points of the lounge. It centers a square black painted wooden flower box, whose lush green leaves echo the green marbleization of the floor's asphalt tiles.

The lounges, like the rest of the theatre including the top floor executive offices, are completely air-conditioned.

Generous Waiting Space

John J. McNamara, well known New York theatre architect, confirms the trend toward the intimate art house type of motion picture theatre, which has met with marked success. He emphasizes the necessity of including unusually generous waiting space in the plans for all modern theatres.

In designing the completely rebuilt Little Carnegie, another New York midtown art theatre, this architect planned roomy lounges, a television-music room, an art gallery, and a small modern kitchen-pantry adjoining the large main floor lounge where coffee regularly is served.

Gay and brilliant colors are used to give an air of sophistication and opulence to large midtown motion picture palaces, where a highly dramatic atmosphere seems most desirable as background for colossal stage productions and wide screen or first run presentations. Here, too, patron comfort and pleasure are adequately achieved only through skillful planning of furnishings in combinations contrived for greatest effectiveness.

Exciting red is an obvious first choice as key color for a big center city theatre decor, since most people associate all shades of red with activity and stimulation. Crisp Cardinal red, carnelian, deep Toledo red, or dark-toned quarry red combine beautifully with shades of tan or beige, citron yellow, gold, off-white, orange and green.

The daily wear and tear on floors caused by heavy traffic, and the marring and soiling of wall finishes, whether plaster, paint or wallpaper, add up to damage which requires expensive and regular renewal or replacement. This especially is true in theatre lounges. Inevitably greasy popcorn or peanuts, sticky candy or other refreshments, are ground underfoot and careless fingers stain the walls.

Wall and Floor Coverings

For walls of permanent beauty, smart coloring and long life, which require little upkeep and eliminate the need for regular redecoration, theatre owners more and more are using Kentile asphalt vinyl, rubber or cork tile for wall coverings as well as floors. Available in a wide range of plain and marbleized colors, plus a wide range of decorative insets which give unlimited design possibilities in eye-catching motifs, directional signs and traffic lanes, these resilient tiles give low cost colorful beauty and modern efficiency to theatres.

The Roxy Theatre, Kansas City, Missouri, one of the Durwood Theatres, with seating capacity for approximately 1,000 persons, installed vinyl tile in front of the concession stand and special grease-proof asphalt tiles, which are three-sixteenths of an inch thick, behind the stand. Adjacent to the lounge, 720 square feet of asphalt tiles were used on rest room walls and 320 square feet on the floors, choosing a combination of Rouge Acajou red and Sicilian blue with black feature strips for one, and Cippolino dark green and Gardenia light green with a floor of Grammont light brown for the other, with double black feature strips and black KenBase.

Richard M. Durwood, theatre supervisor of Durwood Theatres, highly praises both the asphalt and vinyl tile, which have been in use for over a year.

"We have found it to be a very fine tile and most effective," he says. "Formerly we had trouble with wallpaper being cut up by vandals and children, but we do not have that trouble with the tile and have not had to replace any sections. In addition, the colors have brightened up the rooms and made them modern and attractive. Both the Ken-Flex vinyl tile and the special grease-proof Kentile asphalt tile have held up magnificently under exceedingly hard wear about the refreshment section without showing any signs of use. We would repeat the procedure in re-doing any of our other theatres."

In busy downtown Detroit, the 1,100-seat Roxy Theatre, a unit of the Detroit Theatres Enterprises, has replaced carpeting in their large foyer lobby, which doubles as a lounge and waiting space, with colorful KenFlex tiles.

The theatre plays daily to audiences ranging from 2,500 to 4,000 persons and resultant traffic necessitated frequent, expensive replacement of worn carpet, until the installation of KenFlex tiles did away with the costly problem. The management reports that the easily maintained tiles show no sign of wear, despite constant use.

Smart color decors for large center city theatre lounges are Napoleon gray asphalt tile walls, if the room is below grade, or cool looking green and white marbleized white ivy vinyl tile, underscored by floor tiles of bright Rouge Acajou red asphalt, Chinese red vinyl or the cushioned elegance of Rosso DiLevanto red KenRubber tiles. Black or red borders and feature strips and custom-order die-cut themetiles add drama to the decoration and bold patterned or wide striped draperies of red, gray, beige and black, with light gray furniture upholstered in deep red, provide an inviting ensemble.

The rich, mellow texture of Kencork's random natural cork tile tones, which range from light oak to dark walnut, make ideal wall and floor treatment for distinguished theatres of every size and type. Restful to the eyes and sound absorbent, it provides a subtle background for modern drapery fabrics and smart decorator colors.

Nature's color, green, is an excellent color for the decorative ensemble of a neighborhood theatre which caters to the entire family. Pastel green walls and leaf green woodwork accented with leaf green printed draperies, and natural blond wood lounge furnishing upholstered in Toledo red fabric may be underlined with a floor of Greek Skyros beige tile with a modern design linear pattern of Cardinal red or Aspen green stripes.

Owners of suburban or neighborhood theatres have come to regard the lounges as the living rooms of their houses, and are making them more attractive by modernization and redecoration. Management of the Century Theatres Circuit, a chain of 35 neighborhood theatres with a combined seating capacity of approximately 50,000 in Brooklyn, Queens, and Long Island localities is carrying out an extensive program designed to make these theatres more attractive to patrons.

New mirrors, upholstery, floor coverings and modern lighting fixtures have been installed and particular attention has been given to making the lounges comfortable and pleasant. By using bright colors for decoration of lounges an air of gaiety is created with promise of entertainment in the theatre's program.

Shades of blue, from navy to sky blue, are a good choice for walls and ceiling in a conservative theatre lounge, with asphalt tile flooring in Napoleon gray and Travertine gray and furnishings upholstered in deep green, pewter gray or citron red. Accessory notes of off-white, soft pinks, brown, tan or terra cotta may be used to accent the decor.

For an ultra modern lounge decorative plan, yellow walls, cream ceiling and mauve gray woodwork, furnished in bleached wood with Toledo red or leaf green upholstery, could be highlighted with an asphalt tile floor in veined Carnelian or Travertine gray.

A main floor or mazzanine lounge can be attractively decorated by using a vinyl tile floor of gay pink with arresting rouge inserts, lemon yellow walls and a white acoustical tile ceiling, set off by vari-colored drapes and bright red accents.

Or brown tile relieved with wide strips of pale beige tile may be used for the floor with one gray-green wall and three sand-yellow walls and a white acoustical tile ceiling. Drapes with alternating wide stripes of blue-green, beige, gray and black, and light gray wood furniture upholstered in deep red would complete this attractive decor.

CONCLUSION

Small lounges can be given a more spacious look by the use of light colors; darker colors will make large lounges seem more intimate. Greens and blues are cool looking colors that give a restful, relaxed air, while shades of red, yellow and pink make artificially lighted lounges appear warmer and friendlier and have a stimulating effect on patrons.

Exhibits which often tie in with the current motion picture have been conducted for several years by three Trans-Lux Theatres in Manhattan. Collections of tropical fish, painting, caricatures, toy soldiers and other hobbies are exhibited in the lobbies of the theatres at 60th Street and Madison Avenue and 85th Street and Madison Avenue and in the downstairs lounge of the Trans-Lux Theatre, 52nd Street and Lexington Avenue.

Managers of neighborhood and suburban theatres, by initiating lounge exhibits of youthful customers' hobbies and the many ceramic and other handicraft skills of adult patrons can stimulate business and make the theatre an important part of the community's social and cultural life.

THE SPACIOUS lounge of the Little Carnegie (left) is given a feeling of greater depth by the geometric design of the floor covering. The television-music room of the theatre uses harmonizing brown furniture and green floor carpeting. Fiberglas screen print material covers one wall completely.





Fountain of Youth for Carpets

A Description of the Process Which Makes it Possible to Restore the Original Colors to Still Sturdy but Faded Theatre Carpeting

By FRED C. HILD
President, Hild Floor Machine Company

BRIEF: ***One of the most costly items in a motion picture theatre is the carpeting . . . representing a heavy long-term investment . . . Because of the heavy abuse to which these carpets are subjected in the normal operation of a theatre . . . they usually lose their rich original colors long before the carpets are ready to be replaced . . . This article describes a process which makes it possible to easily and quickly restore the original colors to your carpeting . . . and in no way harm the fabric . . . There is specific information on how the process works . . . and exactly how it should be used . . . There are also valuable tips on general rug care which should be of interest to any theatreman.***

Although theatre carpeting and upholstery is usually tightly-woven for many years hard-wear, the dyes in the fabrics fade and become dull with dust and street grime tracked in. The upholstery and carpeting then take on a drab, dingy appearance unattractive to both theatre owners and the public. Such fabrics are often replaced—at great cost—long before the threads themselves have ever begun to wear thin.

Badly-faded, but still good carpets and rugs can now be successfully color restored to give many more years wear by using a thoroughly tested recoloring process.

With this recoloring process, the original colors can be restored in their original rich beauty. Since the color restoring can be done at a fraction of the replacement cost of carpeting and upholstery, the process saves the average theatreman a substantial amount of money on his investment. A well-woven fabric is not injured in any way by the recoloring process. Carpeting or upholstery can be color renewed time after time until the threads of the fabric finally give out from old age.

Simple Process

Recoloring upholstered theatre seats, stair and floor carpeting is a simple process. The coloring agent, called Re-Color, can be mixed right in with the cleaning solution—or applied after cleaning if the soil in the fabric is excessive. No special equipment is needed, nor is it difficult to mix the colors. All that is required is to mix the coloring agent with water, and apply. It is recommended that you practice a bit on old pieces of fabric first to give you the "feel" of handling color. Otherwise there is no trick to color-restoring.

Re-Color is not new. It has been widely used by professional cleaners for more than 15 years, but is now available to the general public for the first time. It is estimated that literally millions of square feet of carpet and upholstery materials have been successfully recolored by using this process.

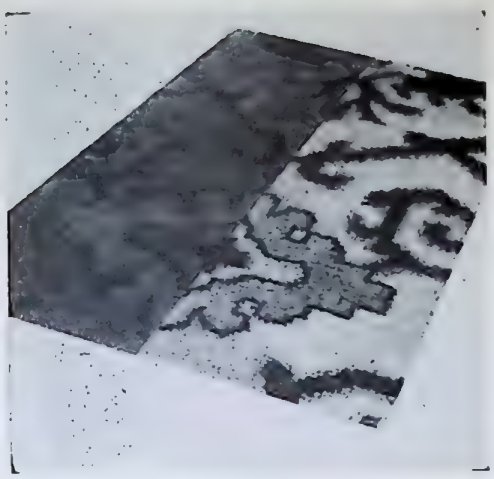
How It's Done

Just how do you go about recoloring faded fabrics? Well, there are two choices. If the fabric is only moderately soiled it can be cleaned and recolored in one simple operation. You mix the color right in with the cleaning solution. The color works with any synthetic cleaner, but is not recommended for use with a soap-base cleaner. As in the regular cleaning operation, all spots must be removed first.

No special equipment is required. You can use either a carpet-scrubbing machine or a brush and pail. If you use a

THE carpet in a theatre, such as that found in the Tennessee, Nashville, may have years added to its life by restoring colors faded from use.





HERE is a piece of carpet showing it before it was treated (left) and after being recolored.

machine, you run it straight across the area with the solution turned on. Then return over that same area with the solution turned off. This insures even application. Continue until the entire section is cleaned and recolored. Allow it to "set" for about 30 minutes. Then go over the area with a vacuum to remove any excess color and moisture.

If you use a brush and pail start with a sliding motion. Make sure you brush the color in evenly. **Caution: do not hit fabric with brush.** Work over the area as recommended, back and forth, until the area is completely cleaned and recolored. Again, remove any excess color. Of course, recoloring can also be done with a spray. Use 25 to 35 pounds of pressure. Work back and forth, and remove any excess color.

It is wise when recoloring a carpet, to mask baseboards with cardboard. However, the Re-Color won't stick to a hard surface. It wipes off woodwork, etc., easily.

If the fabric is heavily soiled, it should be cleaned first. Then the Re-Color can be applied, following the same procedure as given before.

Other Uses

Carpeting, quite often, has faded more in some sections than in others. For example, lobby carpeting that is exposed to more light than that found in the auditorium, will fade more readily, and unevenly. The more faded areas should be recolored first, and left to dry. Then the entire carpet can be recolored. It will all match when the job is completed. To be absolutely sure of this, the edges of the two areas should be blended by brushing gently.

Perhaps the upholstery and carpeting are in fairly good condition—not particularly faded—just getting a little dingy looking. Adding a very small amount of Re-Color yellow to the cleaning solution gives the fabric new brilliance. The yellow brightens up the light areas, and adds new richness to the darker ones.

The Re-Color dries very quickly. For instance, a recolored carpet can be walked upon almost immediately—if the excess color and moisture are removed as recommended. The upholstery dries rapidly also. Therefore, no business time need be lost when theatre carpets are recolored.

It should be emphasized again that Re-Color is as easy to mix as it is to apply. The color itself comes in concentrated form, and to get the shade needed you either add ordinary tap water, or another of the basic colors plus tap water. For example, if you are using green you add as much water as is required to get the shade you desire. If the mixed green is too dark, add more water. If it seems too light, add more color concentrate. The color dries slightly lighter than it appears when wet.

Colors

There are 12 basic highly concentrated shades: beige, blue, blue-gray, red, brown, gray, green, rose, rust, taupe, wine, and yellow. However, you can get just about any other color you would want by intermixing these according to the simple directions.

If the fabric is a solid color, you simply use that color mixed with water as needed. If the fabric is multi-colored, with a pattern, select the predominating color and use that. Suppose the carpet, or upholstery, has a rose background, with a many-hued flower pattern. Use the Re-Color rose, and the background is restored to its original beauty, and the rose color seems to enhance all the other colors of the fabric. Actually, it affects only its like color. The green concentrate only affects green in faded fabrics, the red only red, etc. But once the background color is restored, all the others in the fabric seem to take on new richness.

It should be emphasized that Re-Colors are absolutely safe. They won't rub off, or flake off. They are as permanent as the original dyes, where good dyes have been used. And Re-Color will usually last longer than cheap dyes. Since most theatre upholstery and carpeting is quality-fabric, exhibitors can expect their color renewing job to last as long as the original dyes lasted. And when the color does start to fade, it can once again be re-colored without any harm to the threads.

Practice Required

The professional cleaners who have been color-restoring since this process was first perfected in 1937, all seem to agree on one thing—the only requisite for becoming an expert color-renewer is practice.

Practice on small pieces of fabric is necessary to get the "feel" of the process, as we mentioned earlier. Color-mixing is easy, application is simple. But the color-renewer must be familiar with all the colors, and how they react on the fabric. Cut a few pieces of old carpet or upholstery material into strips four by 12 inches or so. Clean and apply Re-Color to half of each strip, using a different shade for each clean section. It is really surprising what a difference the color will make in a faded fabric.

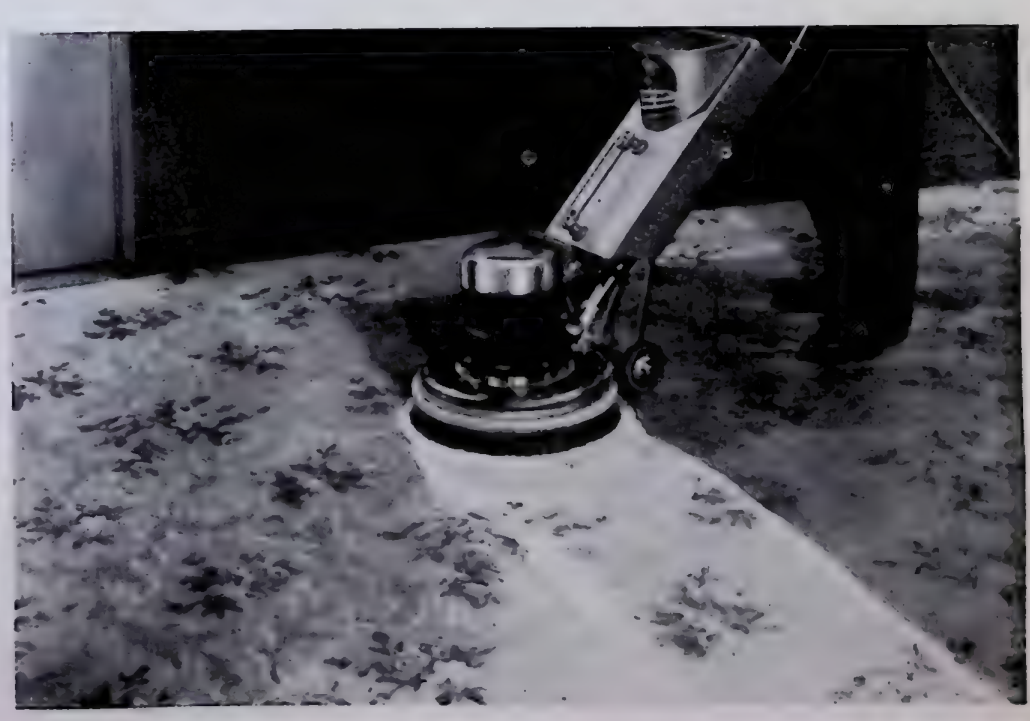
It is a good idea to try out each one of the 12 basic colors, and also to try intermixing these colors. It is said to be the best way to discover how to get the exact color you want. Remember, however, all colors dry lighter than they appear when wet.

Another suggestion offered is the use of white cloth, gimp or absorbent paper. When the color is mixed, dip any of these into the solution, and let dry. Unprinted margins of newspapers make good samples because they absorb the color and dry so quickly. If the dried sample appears too dark, just add water.

It is a good idea to keep an accurate record of just how much color concentrate, and how much water was used to get the proper color. That saves mixing time on the next job. It also insures your getting exactly the same color when needed for another recoloring job.

After practicing on several swatches, you will be ready to tackle the biggest and most expensive piece of carpeting.

IF A carpet scrubbing machine is used to apply the recoloring agent it should be run straight across the area with the solution turned on. Then return over the same area with the solution off.



Wide Screen Frames

A Look at Some of the Problems Involved in the Use of Curved and Straight Screen Frames With Various Wide Screen Systems

BRIEF: *With the development and acceptance of the various wide screen forms of screen presentation . . . a number of problems have naturally arisen as a result . . . One of the areas which has been under a great deal of change . . . naturally . . . has been the size and shape of the screen frame . . . and the stage . . . The need to have wide screen frames . . . some curved . . . created quite a problem as regards flying . . . so as to be able to use the stage for live presentations . . . This article . . . prepared by a veteran expert in the field of stage and screen frame construction . . . offers some sage advice on this subject . . . with particular emphasis on how the problem of flying the structure may be solved . . . There is other information . . . of a more general nature . . . covering other sectors of this particular problem . . . which is currently the cause of much concern to many large and small exhibitors . . . Some of the answers will be found here.*

By C. E. TOMPKINS
President, J. R. Clancy, Inc.

In the past year there have been major and outstanding changes from the standard motion picture presentation to the new CinemaScope method of presenting motion pictures. The ultimate desired result is to give the public a larger, clearer, panoramic type of presentation. This necessitated the development of stereophonic sound which helped to obtain this desired effect.

In addition to the new type lenses, screens, sound units, and projectors, it has become necessary to design and build special screen frames with built-in curves and angle tilting. After this new unit had been in operation a short time many exhibitors realized that due to the large screen frame, they had lost the use of their stages for other types of shows and productions. It then became necessary to consider flying these complete screen frame units safely, quickly and as economically as possible so that the show, whether motion picture or stage show would not be interrupted.

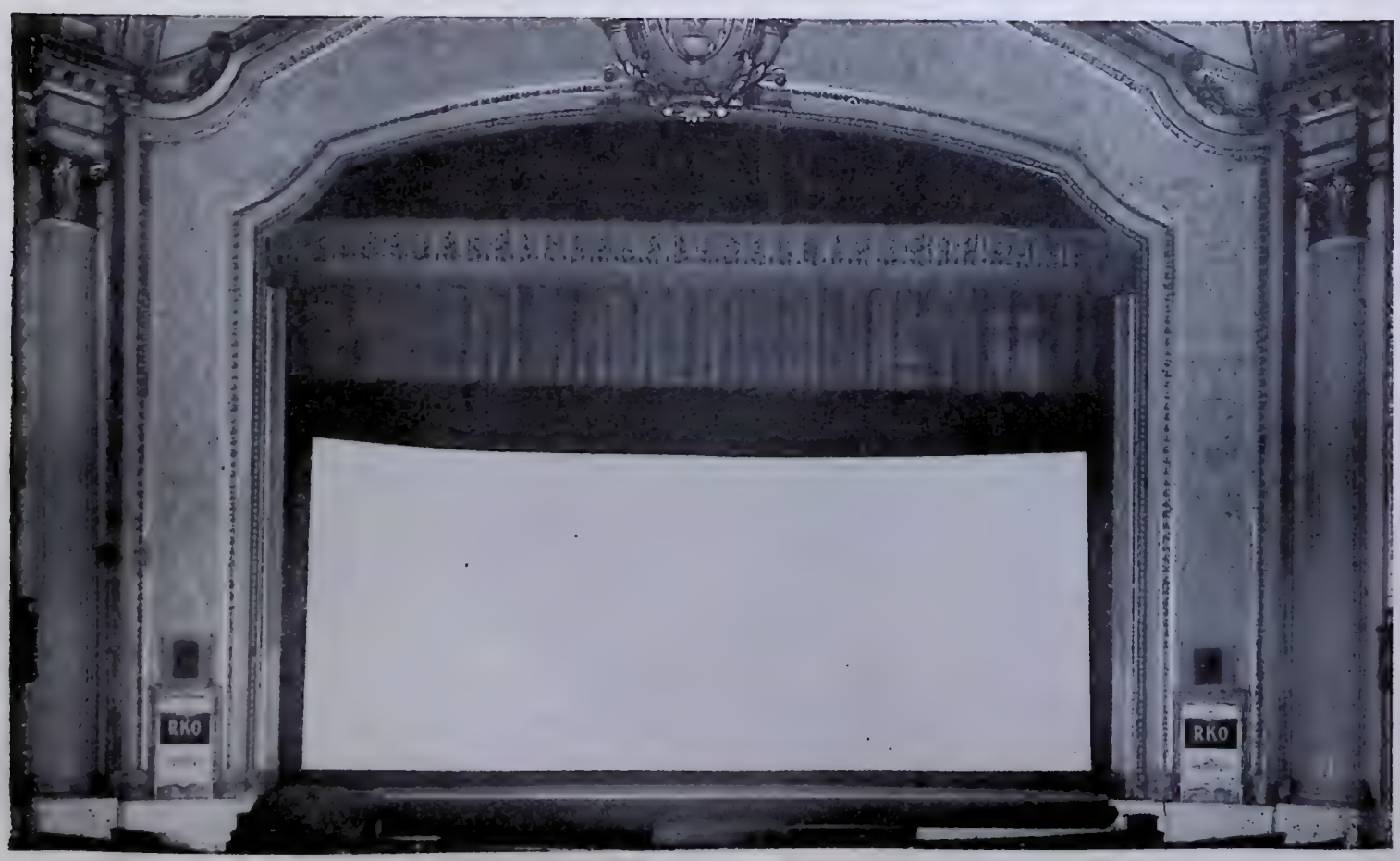
Flying

Because of the unusual type of frame construction and weight due to the large sized units, this required engineering technique and professional installation skill. Before making these CinemaScope installations a thorough survey of the existing building conditions and the different problems that would be encountered during this new construction had to be made in order to give the exhibitor a complete and satisfactory operating job. This work should be done by competent engineers who are familiar with all phases of theatre construction and installation work, and includes the surveying and checking of existing gridiron conditions, present locations of counterweight sets to be moved to a new location, and available power specifications. One of the most important things to keep in mind at this time was the actual material and necessary construction required to give the owner the most for his money.

This preliminary work must also consider the design and reinforcing of the present screen frames with additional steel members to stiffen this frame and hold the required tilt and curve in the same position at all times and under all conditions, without the use of bow tension cables and other temporary wall or floor bracing.

Two or three counterweights are generally required to fly these units and also help to give smooth and easy manual operation.

THE problems involved in the proper installation of a CinemaScope screen, as seen here, are many and require the services of screen experts.



After this rigging for flying the screen and frame is installed then the edges of the screen are masked in the usual manner with consideration given to the masking of the bottom of the screen frame at the floor, which is generally eight inches to 15 inches high, depending on the projection angle and the stage apron. The flying top masking border is then installed to fit the different aspect ratio of the films to be shown and this border is curved to suit the frame and must be flat with no fullness and have a straight clear cut bottom edge as this masks the top of the picture.

The material for the masking borders should be a good grade of black Cammando Cloth or Velour. This border is also installed on a counterweight set and may be manually or electrically operated.

Next, the screen curtain and track must be installed ahead of the screen and masking border and kept as close as possible to these to give the best results. The tracks may be curved or straight depending on the amount of curve in the screen and frame. There are several good tracks available that are suitable for this use and may be manually or electrically operated as required. These tracks may be hung dead but preferably on counterweight sets.

Screen Curtain

The material for the screen curtain should be a velour, damask or satin, unlined, and in a color to blend in with the theatre color scheme. Sometimes the leading edges of the curtain are reinforced with additional stiffening material so that they may be used for masking the sides or edges of the picture in conjunction with the top masking border. However, the better way for installing and operating side masking is to install two single light duty curtain tracks on each off stage side of the screen frame. These will have to be installed in such a manner that the curtain legs will clear the entire height of the screen and not rub or leave marks on the screen while being operated.

The material for these legs will be the same as that used in the top masking border. These legs will have to be wide enough to mask the screen for the narrowest width picture required, as well as the largest CinemaScope picture width. These tracks will also have to be long enough to bring the legs as far on stage as required as well as sufficient distance off stage to clear the required CinemaScope opening. These tracks may be operated in single units or as one unit and may be manually or electrically operated as desired.

New Effect

When considering the new screen curtain and valance that must mask this curtain, considerable thought should be given to this because here is an opportunity to give the front of the theatre stage a new and different affect. This is always important from the standpoint of the boxoffice receipts and also stimulates new interest from the customers point of view.

Another method of giving the front of the theatre and proscenium opening the "New Look" is to have a Simploform or Prosceno-form Contour Curtain installed. These are always electrically operated and can be designed to be very outstanding and attractive.

Several changes and new developments have been incorporated in these curtain installations so that they will fit into the scheme and help make CinemaScope installations more outstanding. These curtains are especially important and a must where the CinemaScope screen extends through the proscenium opening and out into the theatre auditorium and overhead space is limited and at a premium, and there is not sufficient off-stage space to pack draw curtains away in. Contour curtains also react much more favorably to additional high lighting than regular draw curtains do.

CONCLUSION

The new advent of CinemaScope has made great strides in the motion picture presentation in the past year, and the industry is looking forward to greater developments and still greater achievements in the future. In line with future developments it will be necessary to develop new engineering and installation techniques as well as new operating equipment in order to keep pace with changes and developments.

THIS rear view of a CinemaScope screen installation gives some indication of the various factors which must be taken into consideration. One of the major problems is that of flying the screen. It has been found that two or three counterweights are generally required to fly these units.



Stainproof Wall Covering

This Wallpaper Resists Stains and Wear, and Is Easily Cleaned Making It Ideal for Use in Many Parts of the Theatre Building

By JOHN E. WILLIAMS
General Manager, Varlar Div., United Wallpaper, Inc.

BRIEF: ***Materials used for interior decorating probably are given their greatest wear and abuse in the motion picture theatre . . . where throughout the year thousands of people pass through . . . Since it is important for a theatre to look well . . . in addition to showing good films . . . the materials that go into the theatre must be of such a quality as to withstand the wear and tear to which they will be put.***

One area of the theatre which is constantly getting soiled is the wall covering . . . Stains from popcorn . . . dirt brought in from the streets . . . children marking up the walls . . . are some of the abuses to which the average theatre wall covering material is subjected . . . This article discusses a new wall covering material which is said to be stainproof . . . as well as resistant to wear . . . abrasion . . . etc. . . . There is information on actual tests . . . as well as a look at some of the various styles available. . . . There is also a complete section devoted to the proper installation of this material.

Just as the theatre operator or motion picture producer is always on a constant search for something new and exciting to offer the public, so do the manufacturers of the many products that go into a theatre seek out new and better materials. And certainly no exception to this is the designer and manufacturer of wallpaper.

New wallpapers, such as those of United Wallpaper, Inc., the world's largest wallpaper manufacturer, stress the changing color shades that have become increasingly popular with the public. These new shades have a clarity of color never before produced, and the colors themselves are in more pronounced contrast, and so add heightened interest to any room in which they are used.

New Patterns

The constant search for something new culminates in new ideas for patterns that have unique decorating motifs. One of the most recent and successful patterns, "Tufted," a tufted effect was conceived by the company's art director two years ago in Paris during a European design trip. Tufted effects are to be seen everywhere — on furniture, etc., but the sun happened to be shining on a jewelers window on the Rue de la Paix on the morning of that day, with just the right amount of brightness to light up the silk and bring out the tufted effect. An artist sketched it and caught the realism—and another idea clicked. An interesting sidelight is that this particular paper was used, at the time of its introduction, as a covering for the speakers podium during a Democratic National Convention held in Chicago. Because of the tremendous TV, newspaper and magazine picture coverage devoted to this convention — this particular pattern was undoubtedly viewed and reproduced in pictures more than any other wallpaper pattern in history. It gives such a realistic appearance of tufting that many of the Press Association described it as a "tufted leather" covering. One of the downtown movie houses in Chicago also papered the outside of its lobby with a blue coloring of this particular pattern as an attraction-getter for the picture that was being shown there at the time, "The Moon Is Blue."

Other even more outstanding successes are the "Dorothy Liebes Weaves" which were designed and developed by United's own studios in collaboration with Dorothy



THE STRIKING designs, and the wonderful wearing qualities of this stainproof wall covering makes it good bet for restrooms, lounges, etc.

Liebes. The fabrics and textures produced on the hand looms of her studio are judged by Decorators and Architects to be the finest and most decorative fabrics in the world. During a chance visit to her studio, the company's art director sensed that here was wallpaper design if the beauty and richness of her fabrics could be successfully reproduced in print. It was tricky designing to catch the highlights of the various materials she uses in obtaining her effects and to sketch the real *look* of reed, bamboo, silk and metals. There had to be a good deal of "follow-through" in the preparation of the print blocks to insure perfect register in the printing machines or the whole effect would be lost.

What Makes a Good Design

The great popularity of wallpaper must come from what constitutes good design and the answer to that is somewhat elusive. To appeal it must have good color, be useful and pleasing to the eye. It must have good form, character and balance, and in this case, texture, depth and perspective. It is not only necessary to have a definite idea in the creation of art and design, but is important as well that the design does not develop any optical illusion when on the wall. We believe that in most cases for theatres, institutions and homes, preferences are based on color first and form second. Not that we mean that their preference for certain form is entirely secondary—quite a number may study and know exactly what form and color they want, but on the other hand, a great many are persuaded to shape, size and material in a design if the color is what they want. This has been generally true always, but there is a swing to be noticed in present day preferences to more of an appreciation of realism in design — the *look* of texture whether it be wood—reed—stone—fabric —tweed, the depth and feel of it. Or it may be the *look* of embroidery or lace or porcelain effects from Italy or Sweden. Or again it may be the real *look* of flowers designed and composed in a hundred different ways — leaf patterns of ivy or tropical ferns and palms, etc.

Also popular are papers which we call "conversational papers" and a wide variety of subjects can be found—there is humor in most of them and they are bright in color—startling reds and green backgrounds, blacks and silvers. The theatre operator may find it wise to use one of these papers in his lounge. For example, a theatre lounge may be made up to look like a sitting room of the turn of the century, and in this situation a "Gay Nineties" pattern would be perfect to help set and maintain the mood. For theatres with "Cry Rooms" a wallpaper design filled with cartoon characters, cowboys, or similar subjects would be a wise investment. The possibilities are as varied as the number of different patterns and the imagination of the exhibitor.

In the endeavor to please and to be different, if at all possible—there have been designs created of which a great deal was expected, but the results were disappointing. The reasons are difficult to explain—perhaps they were a little ahead of their time or the market, lack of understanding of new trends on the part of distributors, or not put in the right price range.

Increasing Popularity

Many times there are designs which show increasing popularity each year over the previous year, and are known as old standbys. Such a standby pattern that has achieved remarkable sales success is our patented "Cedar Wood" wallpaper. The paper stock used for this design is made from genuine cedar wood pulp, and is printed on special rotogravure equipment to simulate a natural cedar wood design. It also embodies a cedar wood scent that might make it useful in certain parts of drive-in theatres, and conventional houses. For example it might be used near drapes, or near the uniform lockers. Several million rolls of this pattern, in the same design and color, have been sold since its introduction over 15 years ago, and it is still selling as strong as ever today.

All kinds of well-designed floral papers will always be in demand. They are the kind of wallpapers which do not demand a change in all the other furnishings — draperies, carpets, etc. They also have a design that, while not necessarily the favorite of every patron of a theatre, usually will not be actually "disliked" and resented, as might be the case with more extreme or unusual designs. And while it is impossible to please everyone, it is important that everything in a theatre be of such a nature that it will not offend or antagonize its customers.

Through study and observation, we are aware of trends and changes in other furnishing fields. The shift of taste, in both design and color, has its effect on the designing and coloring of wallpaper. These changes are not, for the most part, rapid, and can be seen coming and waning. For instance, if the taste for drapery materials goes in the direction of larger and bolder more striking patterns, the walls of necessity need texture and softer effects—this is obvious and the reverse is true also. The most successful wallpapers from a sales point of view, and from the satisfaction they give when on the wall, are the ones which create a background in which to relax. Wallpaper seems to live a double life—first it should attract by its smartness and sometimes vibrant color and then, when used, it is best if it recedes, and is quiet and pleasant to be around. It should serve very much the same function as auditorium light-

IN THIS TEST for fire resistance a piece of Varlar was exposed to a direct flame. It did not burn or glow for more than 10 seconds upon removal.



AN ABRASION test, using special equipment, indicated that Varlar will not show any visible signs of wear after 25 revolutions of the abrasion tester.



ing in that these lights should be bright enough to enable the patron to safely walk the aisles, but should not distract the attention away from the screen.

VARLAR

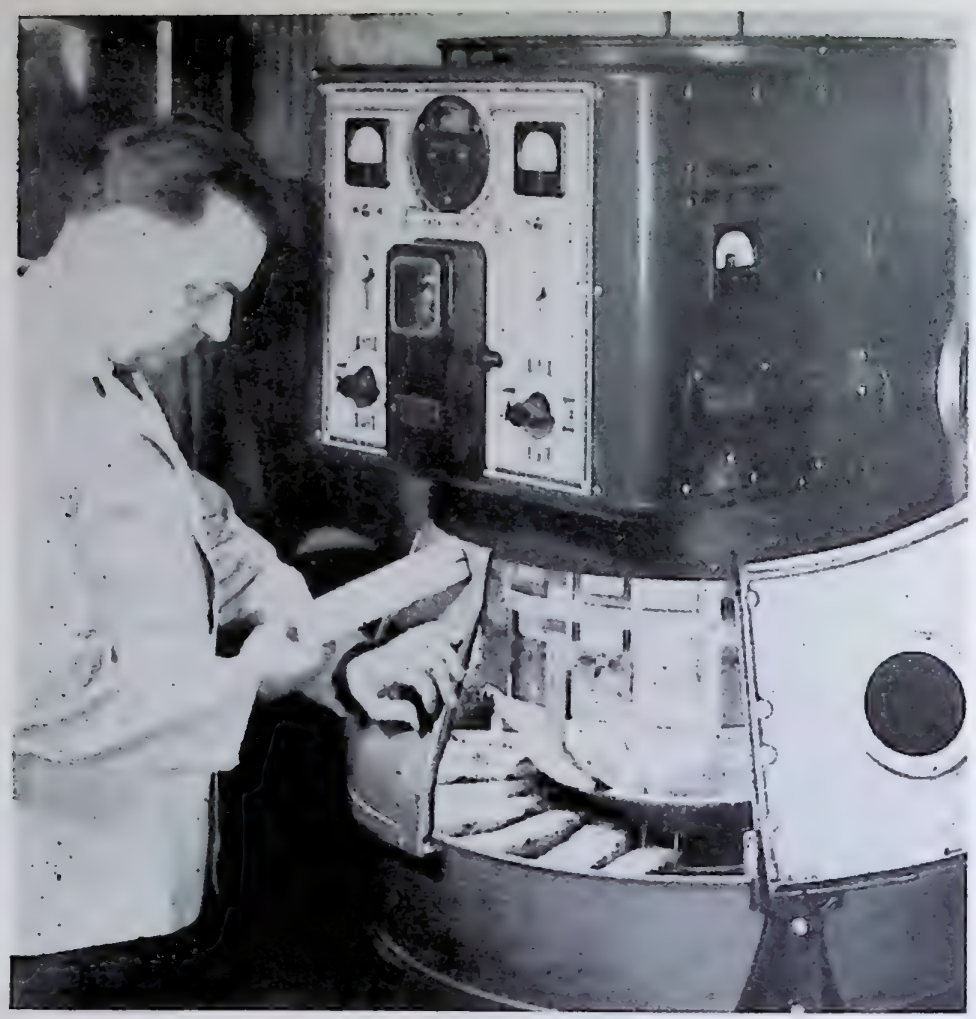
Theatres, as well as national institutions and homes, have discovered a new wall covering that resists stains of all kinds.

The word "Indelible" has lost much of its meaning and most of its sting because of a recent development in wall coverings. At least there is no such thing as an indelible mark on a new type of wall covering that is now beginning to reach the market. Almost any known type of dirt or stain can be removed simply by washing with soap and water.

Varlar is the name of this new product, and it is defined by the manufacturer as "a stain-proof wall covering."

This wall covering is made by a patented thermoplastic process and a secret formula which permits the use of resins which have positive stain-proof, grease-proof, mildew-proof characteristics. These resins are fused by a new method on paper so that the finished product, often in 10 to 14 colors, can be easily applied to walls and ceilings.

Although Varlar might be classed as a "thermo-plastic wall covering" because of the use of these resins in its composition, it should not be confused with so-called plastic coated papers, which merely have plastic or laminated coatings. Varlar is a fusion of colors, paper, and plastic resins, and therefore, there is no tendency to peel or chip.



ANOTHER test given for this material was one for color fastness. The Varlar showed no fading after 24 hours in the color fast test machine.

The newly developed manufacturing technique results in decorative effects simulating those of wood block printing done by the old masters in the painting and decorating arts. Previously it has been impossible to reproduce these effects except in very expensive and fragile wall coverings, which would not be suitable in a theatre either from an economical view point, or the ability to withstand the wear and tear wall coverings receive in the normal course of operation.

With Varlar it is now possible to economically decorate walls and ceilings, with no fear of damage from stain, grease, crayon, inks, or numerous other disfiguring elements. All of these stains can be removed easily by the theatre maintenance crew with ordinary soap and water.

This wall covering should be of special value around the concessions stand where the danger of grease stains, and stains from the other items sold, is quite obvious. It also may be used in the wash and rest rooms where water and steam may damage ordinary wall treatments.

Complete Line

Varlar is 24 inches wide and packaged in units 50 feet long, containing a total of 100 square feet. A complete line of designs and flat pastel colorings are offered for the purchaser's choice, each one a new, original creation of a famous designer. The designs are unique in that they are processed in such a way as to give them the effect of hand-blocked papers in water colors. This is the first time in the history of interior decorating that it has been possible to achieve such an effect synthetically. How it is done is a trade secret.

Compared With Paint

As the characteristics of Varlar set a new standard for stain-proof wall covering, and the durability of paint has a known value, relative comparison with paint shows many interesting fundamentals.

Comparisons were made between various types of paint and Varlar. Evaluations were made of their respective resistances to stain removal, abrasion, and impact. Also evaluations were made by exposing panels for certain lengths of time under conditions which might be encountered in actual usage. In all cases Varlar was proved to be equal or better than paint, and in certain cases had unique advantages.

Preparation of Test Panels—Plaster panels two feet square were prepared complete with finishing coat, comparable to standard construction practice. After suitable drying, these panels were sized with a coat of varnish. Two panels were prepared in this manner and one-half of the first painted with flat paint, and one-half of the second painted with high gloss enamel. The two types of paint were drying oil paint, representative of the best quality. Two coats of paint were applied allowing the first coat to dry 24 hours before applying the second coat. The latter was allowed to dry one week before testing. The remaining half of each panel was papered with Varlar using Varlar adhesive.

Impact Resistance — A pendulum was devised for this test. It was two inches in diameter and consisted of a brass weight weighing about 400 grams. It was attached to a brass rod 11 inches in length. The rod was pivoted at its upper end so that the weight would oscillate freely. The surface to be tested was placed beneath the pendulum and the height of the latter adjusted so that when the edge of the weight touched the surface an angle of 10 degrees was formed between the vertical line and the center line of the pendulum. This angle was increased to 30 degrees by pulling back the weight and releasing it suddenly. A sharp impact or scuffing the surface thus occurred as the weight struck. Under these conditions no damage was done to the Varlar except for some slight scuff marks which could be removed with soap and water. In the case of the painted surfaces, there was either a scuffiing of the surface which could not be removed, or, as in the case of the high gloss enamel, there was an actual chipping of the paint down to the bare plaster.

Repair of Dented or Marred Varlar Surfaces—One of the Varlar covered plaster panels was struck a number of times with a hammer so as to crack and break the plaster underneath. The paper was removed at this point, the loose plaster was removed, and the hole was patched with patching plaster. A patch

was cut from a piece of Varlar, taking care that the pattern matched and pasted in place with Varlar adhesive. By cutting the patch so the cut followed the outline of a leaf or figure, a neat repair was effected. This repair was not visible from a distance of a few feet. With paint this type of repair is not as feasible due to the impossibility of getting a smooth plaster patch and of matching the color of the paint.

Tabor Abrasion Tests — Test panels were prepared of No. 24 guage cold rolled steel four inches square. Six of these were covered with Varlar using Varlar adhesive, six were given two coats of flat paint allowing 24 hours drying between coats and allowing 48 hours drying of the second coat before testing. Two coats of high gloss were applied to the last six panels and dried in the same manner as the flat paint. Sets of each of the three types of panels were than tested for abrasion, using the No. C-17 abrasive wheel and run up to 25 revolutions each. The second set was run up to 50 revolutions, and so on. Upon examination, both the flat and the high gloss enamel were visibly abraded at 25 revolutions, whereas the Varlar began to appear abraded at 125 revolutions.

INSTALLING VARLAR

Preparation of Walls

Before hanging the Varlar stainproof wall covering it is important that the walls be in perfect conditions. Newly plastered walls should be treated with a solution made of two pounds of zinc sulphate and one gallon of water. When dry always "glue-size" before hanging.

Old unfinished walls and old painted walls must be carefully repaired, all cracks, cuts or gouges cleaned and filled with plaster, and sanded smooth. All excess grease and excess dirt must be removed; "glue-size" old painted walls before hanging and treat old unfinished walls the same as newly plastered walls.

Old papered walls should have all old paper removed. If complete removal of the old paper is impractical, then remove all loose paper, sand all torn paper edges, lap joints or other bumps to a smooth finish, fill all cracks, and sand smooth. If the walls are canvas all loose spots, blisters or torn edges should be securely glued to the wall. If necessary cut and lift canvas, apply Varlar adhesive and roll down the edges smoothly and securely.

Metal walls must be welded at the joints to control expansion and contraction. Screw heads and recessed bolt heads must be filled. Then all raised welded places or bumps must be ground to a smooth flat surface. Wood and composition board walls should not have the wall covering applied to them except in panels so that Varlar does not cross an open joint. Application over a joint will be satisfactory only when joint has been recessed, bridged with wire screening which is securely fastened to both panels, filled with plaster, and made level.



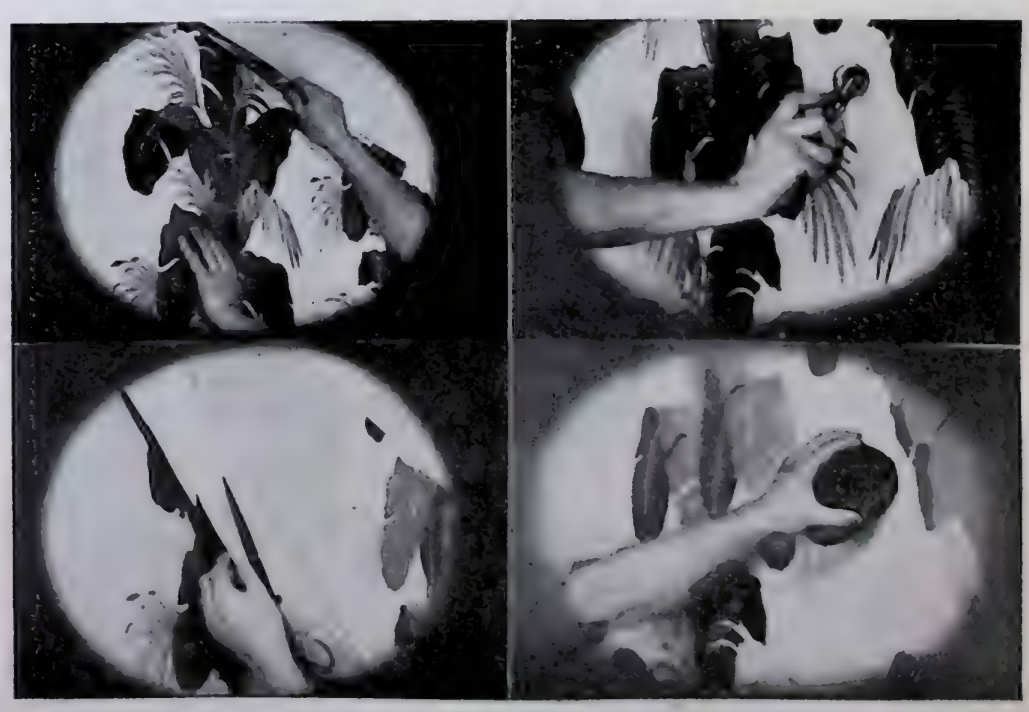
CUT STRIPS of Varlar (top left) to correct wall lengths from top to bottom to allow for matching. After pasting, fold one-half of pasted wallpaper (top right) over on other pasted side. Selvage edges should match exactly. Trim selvage with straight edge (bottom left) just before hanging. Unfold top half of wallpaper (bottom right), and start hanging next to a window or a door, to get a neat job.

Excessive dirt and all grease should always be cleaned from wall before applying Varlar stainproof wall covering. Asphalt, or any similar type of gum should be removed from the wall. In most cases this can be done with kerosene or scraping. An absolutely smooth surface is required for Varlar application.

When Varlar is to be applied to walls touching tubs and wash basins, care should be taken to see that an eight-inch area of wall above the edge of basin or tub is in good repair. The entire area to be covered with Varlar around wash basins, tubs, etc., should be sized with liquid cement and allowed to dry. Bare plastered walls, especially those of new construction, must be tested for dryness of plaster. In standing shower stalls, the walls and ceilings to be covered with Varlar should be free of any surface projections or indentations. Inside corners should be sharp and plumb. Exterior corners of entrance jambs should be rounded if possible. Before application, these parts, especially any joints or repaired cracks or gouges, should be sized with liquid cement and allowed to dry.

Never hang Varlar on a stucco or sand-finished wall.

CREASE OR SCORE Varlar at ceiling line (upper left) and the baseboard line with back of scissors. Release material from wall long enough to trim (upper right) along the scoring line for snug fit. Roll down seams (lower left) to a very tight butt joint, after adhesive has thoroughly set, also at ceiling and base board line. You should then immediately remove excess adhesive (lower right) with a damp cloth.





IN A STEAM resistance test, Varlar showed no visible effects after a 6 hour steam spraying.

How to Hang Varlar

In many cases it is possible to save the money of installation by having someone on the maintenance staff do the job. Varlar stainproof wall covering can be hung easily by those who understand the customary methods, and with the use of regular wallpaper tools and equipment.

When removing the curl from the unrolled strip, do not crease or apply excess pressure. Use the same care required for all quality materials. Keep the entire strip of Varlar flat on the paste table while applying paste. After pasting, the strip may be folded, but do not crease the fold. Placing straight-edge over selvage, trim selvage with straight-edge. Sheet should be allowed to soak 10 minutes or more before hanging.

Cut strips of the wall covering to correct wall lengths from top to bottom to allow for matching. If the pattern is a "dropped" pattern, it is more economical to work with two rolls of Varlar, using every other roll for every other strip. When hanging tints, reverse every other strip. If ceiling is to be covered, apply Varlar to the ceiling before hanging it to the walls.

Mix Varlar adhesive in accordance with instructions. Paste the paper backing of the wall covering with the adhesive, keep entire strip of Varlar flat on the paste table and do not paste more than four strips at a time. The sheet should be allowed to soak 10 minutes.

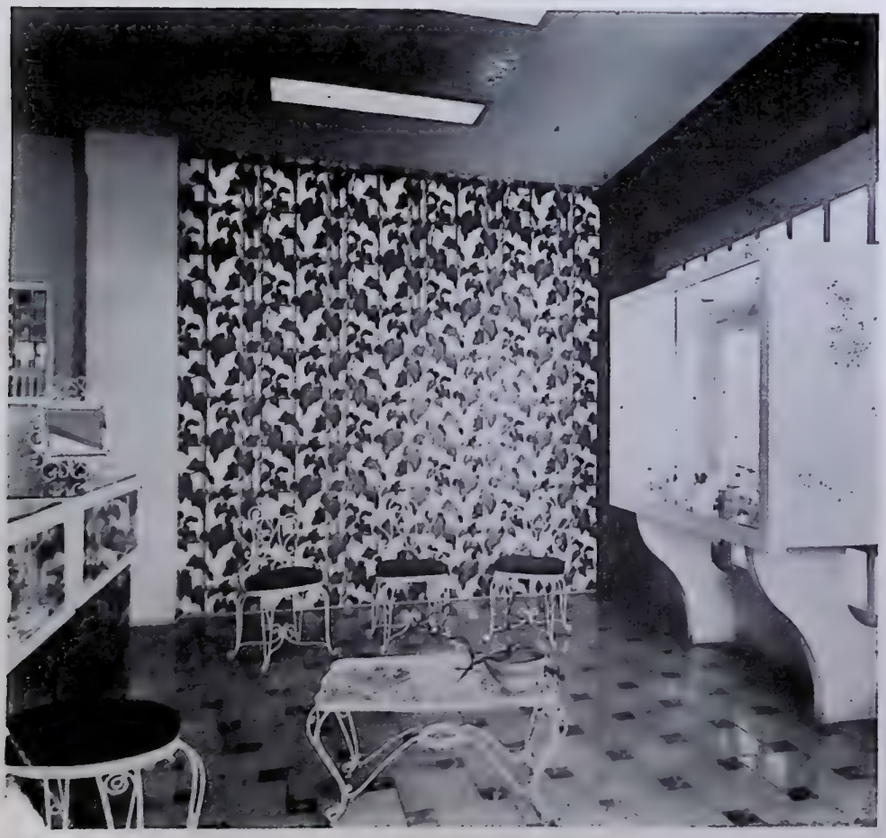
After pasting, fold one-half of the pasted side of Varlar over on the other pasted side. Fold so that selvage edges are matched exactly. Do not crease the fold. Mark selvage width at both ends of folded pattern to guide straight edge placing straight edge over the selvage. Trim just before hanging, not immediately after pasting, using sharp knife or cutting wheel.

Next, unfold the top half of the Varlar folded strip, and let the bottom part remain folded. Unfold the lower half after the top is set in place. Start hanging over or next to a door or window, hanging the plumb line a few inches from the corner to keep the Varlar pattern straight. To insure hanging each strip straight, use plumb line constantly. Place adjacent strips properly to match pattern and to a very tight butt joint. Avoid stretching the Varlar. If wall condition requires unusually tight butt joint overlap, butt to wire edge and roll edge down to get a very tight butt joint. Never lap Varlar unless the lapped edge is first sized with liquid cement.

Crease or score Varlar at the ceiling line and baseboard line with the back of a pair of scissors before trimming to insure exact fit. Then release the Varlar from the wall long enough to trim along the scoring line for snug ceiling and baseboard fit. Replace to a tight butt joint, using a smoothing brush to be sure to eliminate any air pockets or wrinkles. Strips of Varlar should be securely pasted to the entire surface of the wall to avoid blisters.

Roll down the seams to a very tight joint after Varlar adhesive has thoroughly set; also roll tight at ceiling line and baseboard line to permit constant washing of stainproof Varlar. This is very important.

Finally, remove the excess adhesive and liquid cement immediately from the surface of the wallpaper with soap and water, and wipe off with a wet cloth. Do not allow these materials to dry.



ANOTHER INTERESTING example of how Varlar may add beauty and color to an interior.

Home Beauty Treatment for Theatres

A Look at the Various Uses to Which Plastic Wall Tile May be Put in Theatres, and Installation Instructions

Ever since the introduction and adoption of the various new projection and sound techniques, the nation's theatres have been undergoing a number of changes. It is important, however, that these changes not be confined only to the auditorium and the projection booth. The movie-going public has been gradually taught to expect, and demand the finest. There is a fierce struggle for the entertainment dollar today, and it would be less than human if the average moviegoer did not take advantage of this wooing by demanding more for his money.

BRIEF: ***The public has been the subject of one tremendous wooing campaign in recent years . . . put on by all segments of the entertainment world . . . The struggle for the entertainment dollar has become a mighty one . . . and the public has learned to expect more for its coveted patronage . . . One thing that the average patron is demanding these days . . . is theatres that not only present the newest and finest films . . . with the newest and finest equipment . . . but he also insists that the theatres be up-to-date in their appearance and services.***

One area of the theatre which should be given special attention . . . particularly by the small exhibitor . . . is the wash and rest rooms . . . This article discusses the possibilities of redecorating these areas with colored plastic wall tiles . . . The advantages of such a move are analyzed . . . along with a complete description of how this can be done without the need for professional help.

The material and photographs for this article were supplied by Hachmeister, Inc., Pittsburgh, manufacturers of Coronet Plastic Wall Tile.

This situation has forced many theatre operators to remodel their houses, and do all in their power to make their theatres comfortable, attractive, and completely up-to-date. For the thousands of small exhibitors this has placed a further strain on their resources. With the present premium prices on labor and materials, anything which the staff of the small theatre can do by itself is of great importance.

Appearance Important

One of the areas of the theatre which can greatly help or hinder business at the boxoffice is the rest rooms. A theatre may be equipped with the finest wide screen on the market, and show the brightest, sharpest picture in town, but let the patrons find the wash and rest-rooms to be dirty and dingy, and they will curl up in front of their home television sets in great numbers.

One product which can transform even the smallest rest room into a bright and wholesome looking part of the theatre is plastic wall tile. Plastic wall tiles are available in a great variety of colors, making it unnecessary to adhere to the traditional white. It has been fairly well established by research undertaken in various fields, that pastel colors will often be much more pleasing and attractive in areas and products that have for years worn a pure mantle of white. This can be seen in such things as the traditionally white refrigerator. Today there are a number of these on the market that are finished in yellows, greens, and other colors more pleasing to the eye. Even hospitals, probably the most generous users of white, are bringing in more cheerful, if less antiseptic appearing colors.

Color Factor

This switch to a greater use of color in furnishings should certainly apply to the motion picture theatre where the trend toward more and more films in color has become the rule of the day. Therefore, it would be wise for the exhibitor who is thinking of improving the appearance of his rest and wash rooms to look into the use of colors. Plastic wall tiles are ideal for this purpose because they are available in a wide range of hues, and just as important, they do not fade or look drab after a short period of time. In most cases a



HERE is an example of how these tiles may be used in a lobby or foyer area of a theatre. It is possible to obtain tiles in various colors.













HAVE ALL the tools needed, plus the directions which come with the tiles (above). Then make the necessary measurements (left) on the walls. A level line must be drawn around the wall at the height the tile will be installed, to insure straight installation if wall is uneven. These tips are important.

damp cloth and a slight application of some elbow grease is all that will be necessary to restore the rich and gleaming appearance of the walls.

As an example of the range of colors available here is a list of plastic wall tiles that are obtainable from Hachmeister, Inc., of Pittsburgh: chartreuse marble, peach marble, blue marble, rose marble, mint green, cameo peach, horizon blue, cream, sun valley yellow, green marble, gray marble, yellow marble, jungle green, maroon, fiesta red, and black.

DO IT YOURSELF

As was mentioned before, the increasing emphasis on greater beauty and modern appearance in the theatre as well as on the screen, has placed an added burden on the small exhibitor. However, in the case of remodelling the rest areas with plastic wall tiles, the theatremen is fortunate in that they are simple to install, and can be done by anyone, including the type which "can't even drive a nail." It is possible to get all the equipment needed for the installation job when the tiles are purchased, and a full set of instructions will usually be found also. However, for those who would like to see how it is done, the following is a detailed description of how plastic wall tiles would be applied to a wash room.

Lay Out the Room

It is safe to assume that no floor is perfectly level, and therefore the first thing that must be done is to locate the lowest point on the washroom floor. In order to get the exact layout of the wall, measure off as shown on accompanying illustration, and then mark the position for field trim and tile cap, then draw a level line around the room from the top point with a level. It is important to follow this method since a perfect job depends on the correct starting of the job.

Before starting it is important to see to it that all the surfaces are dry and have had all grease and oil thoroughly removed. Although you may apply the tiles over a painted wall, any other type of wall covering must be removed.

After the room has been properly laid out, the next step is to arrange the tile on the floor across the entire width of the wall. Since most walls are one-quarter inch, or more, out of plumb it is very important that both ends of each wall be left open so that tile can be cut to fit exactly. This will give the tile a perfectly vertical and horizontal line. You should balance the space at both the left and the right so that not less than one-third of a tile will have to be cut in order to fill the ends. To accomplish this, remove one tile and readjust. You should never start at a corner with a full tile.

APPLY GOBS of mastic (left) on the wall surface to be tiled. With notched edge of trowel you spread the mastic, using vertical strokes. A patented cutter may be used to cut the tiles. Then establish a center line(below) on each wall and place the tile on the wall starting in the center and working to the right or left. All cut tile less than a full tile will then be in the corners with the cut edge covered by the inside or outside corner piece if done correctly. Care must be taken during entire process.







THE CORNER PIECES (above) give a neat finish and water sealed corners to the job, as can be seen when rule is used. Tile installed above tub (right) is buttered to give added protection where water might do harm. All the shapes are easy to get around by cutting the tile with a coping saw.

Applying Cement

When you are ready to apply the cement you should only use the mastic trowel spreader that will be supplied by your dealer, as this also serves the purpose of a measuring device. Hold the spreader at a 45 degree angle to the wall. Be careful not to apply too much mastic in the back of the tiles, as it will not permit the edges of the tile to adhere properly to the wall, and will cause floating or sliding when cleaning up the finished job.

You are now ready to apply the tile to the wall. Hold the tile in position and snap it into place, making sure that your fingertips do not touch the cement. It would be a wise tip to keep your hands and the face of tile as clean as possible at this point, so that it will minimize the job when it is time to clean up.

Place the tile firmly against the adjoining tile, after making sure that the corners are properly aligned. Press the tile firmly on four corners, but not in the center. This is done in order to assure tight bond to the ridges of the cement.

Installing Cut Tile

The cut corner tiles are applied in the same manner as the full wall tiles. However, there is one additional step that should be taken. Additional mastic should be placed on the cut edge of each tile. This is done so that there will be a more even fit with the inside corner strip. In case of an uneven surface in the corner, the extra mastic enables you to press the inside corner strip against the tiles, and thus even up the appearance.

Inside corners are supplied in four and one-half-inch lengths. To install these inside corners you fit a strip in place, and then spread cement over the flange of the corner. Making certain that you fit the cut edge into the slot of the corner strip, you then install the tile. It is suggested that you butter the cut edge of the tile which fits into the slot, since this will usually insure a more even fit.

Outside corners are also furnished in four and one-half-inch strips. If cove base is used, place moulding above the floor line to accommodate cover base height at the floor line. Then spread the cement over the flange of the corner strip, and install the tile. However, make certain that you fit cut edge into the slot of the corner strip, and press firmly against the wall.

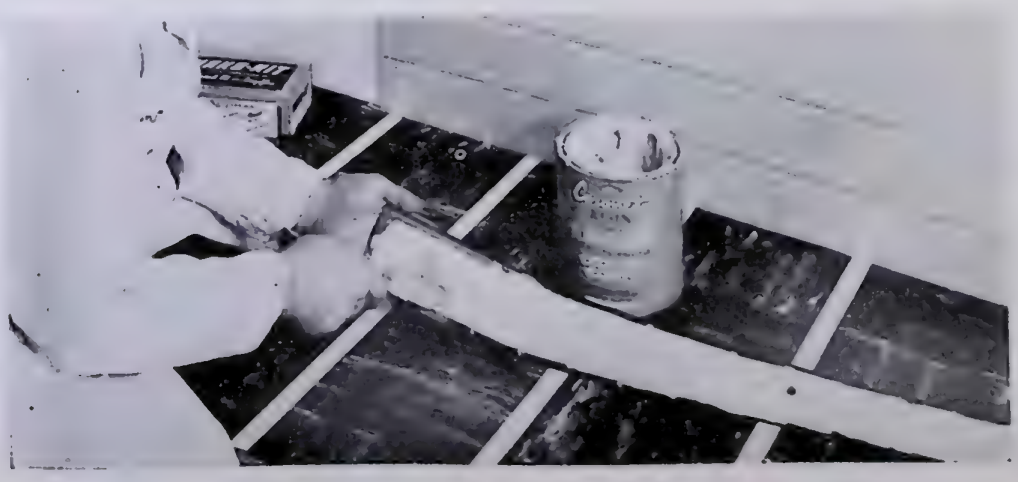
It is suggested that outside corner moulding strips be used since they protect the tile from damage and make a smarter appearance. Both of these points are of particular importance in a theatre.







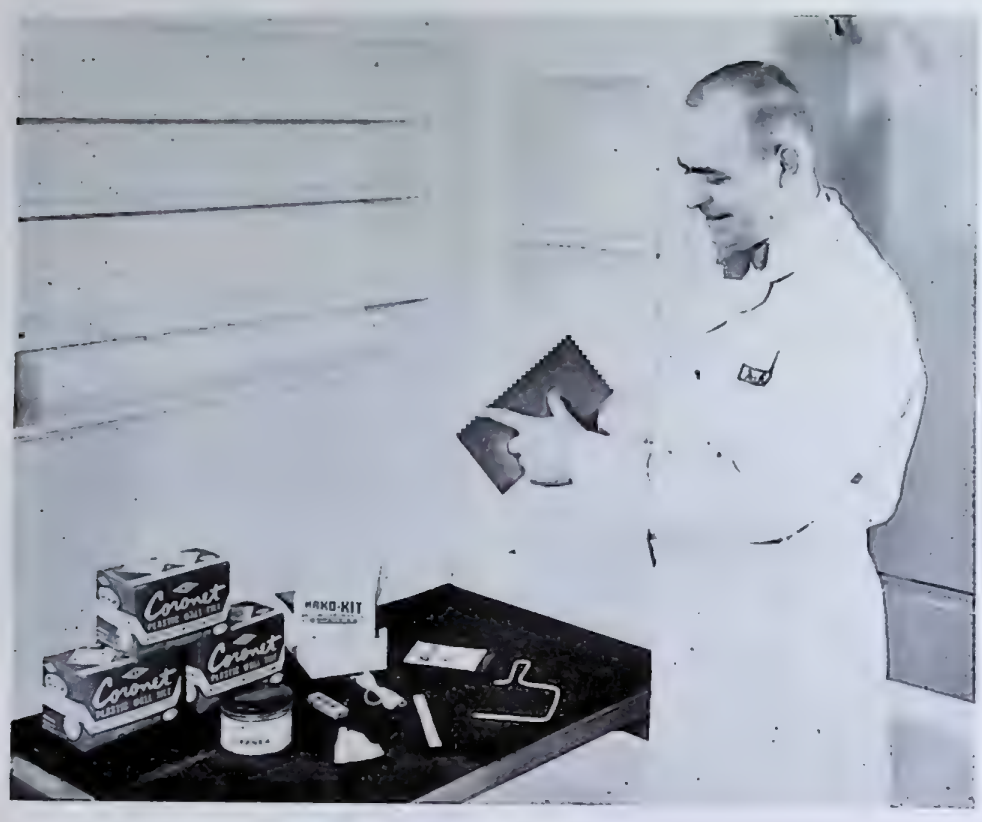
INSTALLING A piece of tile (right) around the fixtures. Next picture shows how an installation can be made neat by using color matching plastic corner piece strips. A paste cleaner applied with ordinary root brush and rubbed over the tile removes any cement on the tile surface with little effort. The picture (below) illustrates how the flexible cove base is applied as last step and the regular mastic cement is applied to the back of the base. This should give you a finished project; and one to be proud of.





Cutting the Tile

It is possible to obtain a patented cutter which has been specifically designed for use with plastic wall tile. Often it will not be necessary to purchase this cutter, but may be rented for a nominal price. If you are unable to obtain this cutter, straight cuts may be made with an ordinary hack saw, which should be standard equipment in any theatre's tool chest. All circular cuts should be made with a coping saw.



USE OF a notched edge trowel (above) assures an even distribution of mastic on the wall, and is designed to aid proper adhesion of tiles. The use of these tiles can result in a room that is both easy to maintain, and, as can be seen by the photograph (below), it is pleasing to the eyes.



Installing the Base

A flexible cove base will make for a rich finished job. Regular mastic is used for application as shown in an accompanying illustration. It is suggested by the manufacturer that you continue your plastic tile completely to the bottom of the floor, and apply the cove base on top of the tile.

A Word of Warning

If all of the directions just given are followed, it should be possible to transform a theatre washroom into a bright and cheerful place in a very short time. However, there are a number of things which should be avoided when using plastic wall tiles.

Although this should not be too likely a case, plastic tiles should never be used anywhere that the temperatures will rise above 160 degrees F. This situation might occur in areas around radiators and steam pipes. All walls containing hot air registers should be tiled up to the edge of the guard, but not under it.

A very important thing to remember is that plastic tile should never be installed when the room temperature is below 60 degrees F. If the job is to be done in the winter the tiles must be brought up to this minimum temperature for at least a 24-hour period.

Half tile and feature tile should be started about the center of a full tile to break the vertical lines. The washroom wall fixtures should be recessed types, or fastened directly to the wall uprights. Do not fasten any fixture to the plastic wall tile directly.

The maintaining of plastic tile is simple, and it may be washed with mild soap and water, or a special cleaner and polish for plastic tile if you so desire. You should not use abrasive type cleaning powders.

CONCLUSION

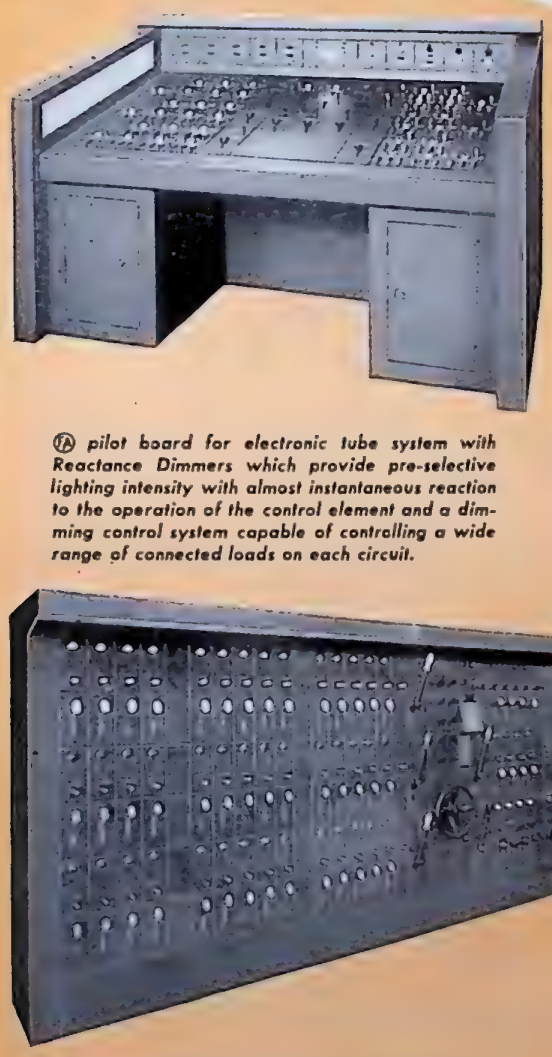
The installation of colored plastic wall tiles in a theatre is a simple and inexpensive means of giving the entire place a feeling of cleanliness, efficiency and furnishing your patrons with the little "extras" that are so important today for any successful operation. As stated before, it is simple to install plastic wall tiles, and in most cases will not require the services of expert, but costly, outside help.

Although plastic wall tiles seem to adapt themselves most readily for use in rest and wash rooms, there is no reason why the appropriate type of plastic tile can not also be used in back of concession stands, where their resistance to dirt would be an extremely useful feature, in lounge areas, or the lobby. This material can have many uses around the theatre, and is well worth the trouble of further investigation on the part of exhibitors who think their theatres can use a little face-lifting.

ON STAGE

in more than 500 theaters throughout the country . . .





Ⓕⓐ pilot board for electronic tube system with Reactance Dimmers which provide pre-selective lighting intensity with almost instantaneous reaction to the operation of the control element and a dimming control system capable of controlling a wide range of connected loads on each circuit.

Pilot Controlboard of 10 All-Master, multiple pre-set remote control system.

STAGE LIGHTING CONTROL SYSTEMS *play a leading role!*

Ⓕⓐ Stage Lighting Control Systems add substantially to the color, beauty, enjoyment, and . . . because they require less maintenance . . . *profit* of all theaters and auditoriums — large and small.

The result of more than 50 years experience and technical "know how" Ⓕⓐ Stage Lighting control systems embody the latest features in design and construction and fit admirably into the plans for all types of theaters.

Built on the unit basis, Ⓕⓐ Controls are long-lasting and trouble free. All bear the Underwriters' Laboratories' stamp of approval. Included in the equipment produced by Ⓕⓐ for theaters are the following:

CONTROLBOARDS for:
Manual Control
Modified Pre-Set Remote Control
Multiple Pre-Set Remote Control
Motor Driven Control
Electronic Tube Control
Mobile Color Lighting Control.

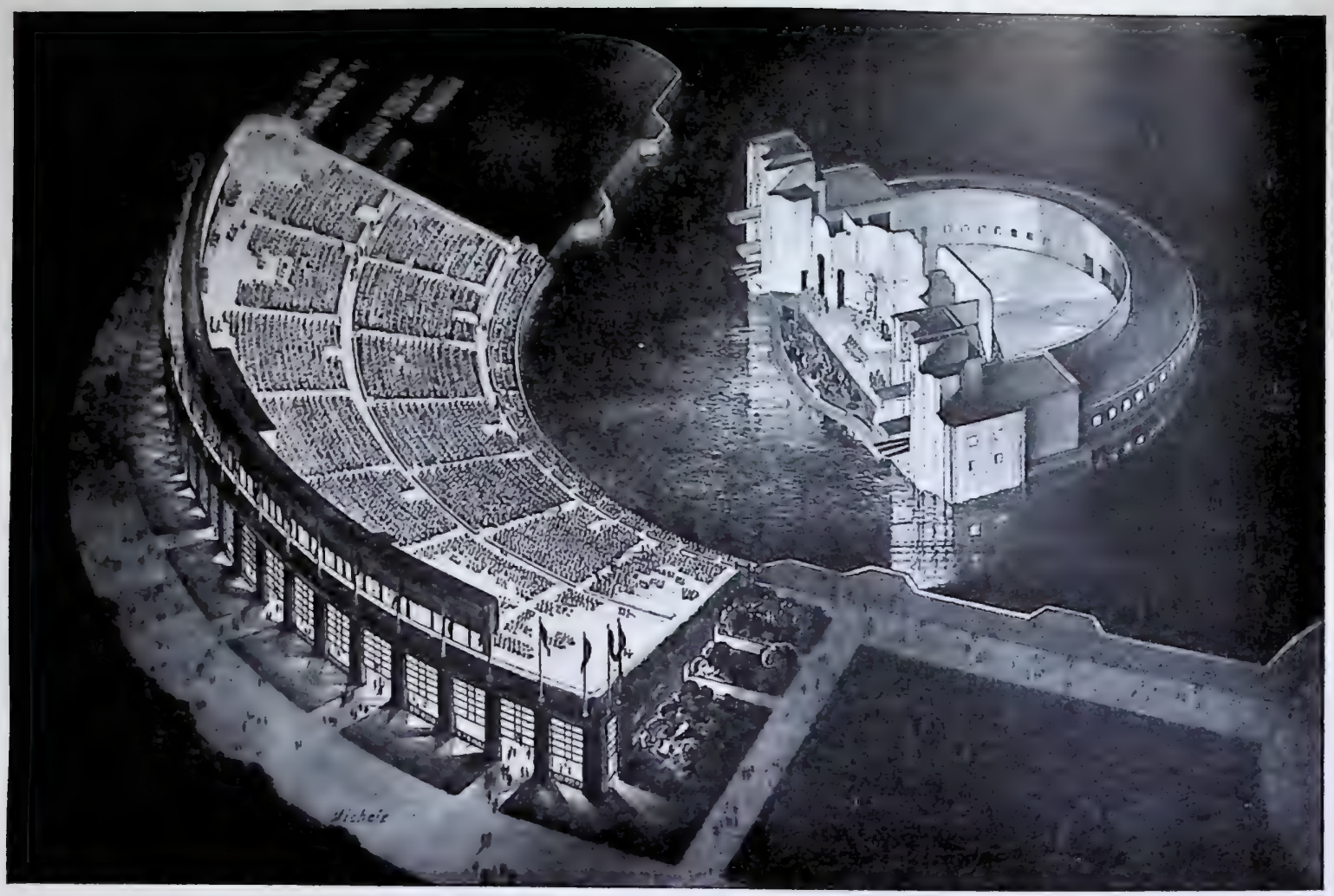
DIMMING CONTROL EQUIPMENT
Resistor Dimmers
Auto-Transformer Type
Reactor Types

If you are planning a new theater or auditorium, or modernization of an existing structure, include a Ⓕⓐ Stage Lighting Control System in your plans. For additional information contact an Ⓕⓐ representative, conveniently located in most large cities, or write for Bulletin 801.

Frank Adam Electric Co.

P. O. BOX 357 ST. LOUIS 3, MISSOURI

Makers of: BUSDUCT • PANELBOARDS • SWITCHBOARDS • SERVICE EQUIPMENT • SAFETY SWITCHES • LOAD CENTERS • QUIKHETER

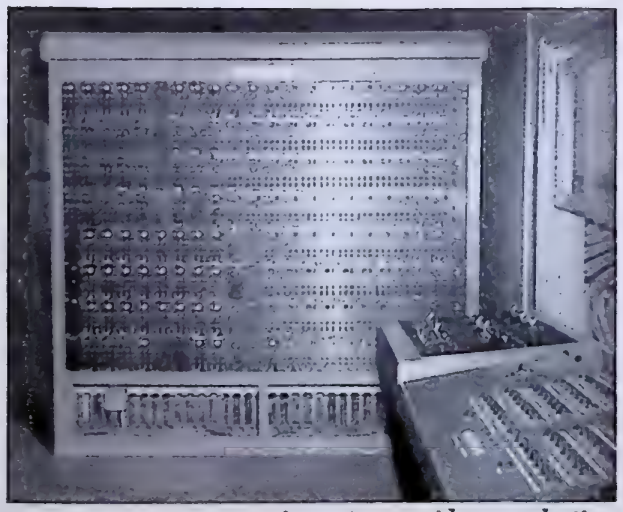


One Million Watts...On Cue

That's what's required to change scenes out at the Jones Beach Marine Stadium, the world's largest open air theatre. This "imaginative lighting" got rave notices in the reviews of "Night in Venice", the first production to play here. Gradations in lighting to indicate any time of night or day, sunshine or storm, to give dramatic emphasis, for subtle changes in mood — all are painted in light from the master control booth high above the stadium. Ten remote switchboards containing Ward Leonard Hysterset electronic controls and reactance dimmers deliver one million watts of pre-determined illumination on cue.

This is the largest lighting control installation in the world, and it accounted for about one quarter of the total cost of the entire project. Only the very best of control devices could have handled the vast and highly complex lighting of a 105-foot stage from a distance of over 300 feet. That's why the Trumbull Electric Department of General Electric made Ward Leonard Hystersets an integral part of the entire installation.

Ward Leonard engineers will be glad to work with you on any problem of dimmer control, regardless of its size or intricacy. Write to Ward Leonard Electric Co., 86 South Street, Mt. Vernon, N. Y.
3.33



PRE-SET CONTROL PANEL in center provides preselection of lighting for three complete scenes, produced "on cue" by master controls in the master console, right.

WARD LEONARD ELECTRIC COMPANY
MOUNT VERNON, NEW YORK
Result-Engineered Controls Since 1892
Ward Leonard's complete engineering (ex) book, "Handbook of Power Resistors," $3. per copy.

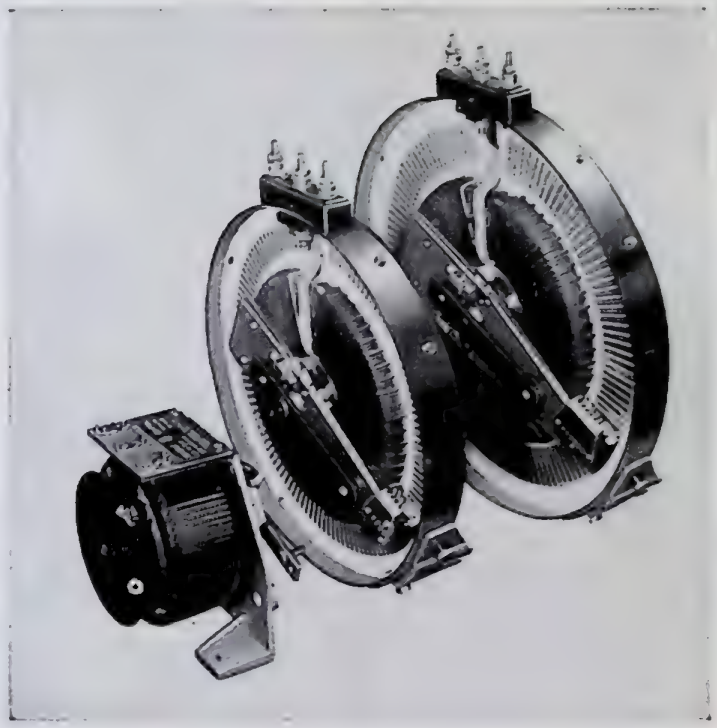
How to get the right dimmer for any lighting control

Check the one really complete line — Ward Leonard's

● Select lighting controls for your theater, auditorium, school, church or hall from Ward Leonard's complete line.

We are the only manufacturer offering *all* types of dimmers — reactance, resistance and auto-transformer, both manual and remote.

Send us complete information about your dimming installation problem. Our engineers will be glad to recommend the proper controls for your requirements. Ward Leonard Electric Co., South St., Mount Vernon, N.Y.



AUTO-TRANSFORMER DIMMERS

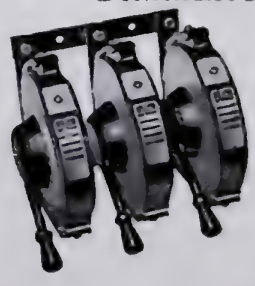
AUTO-TRANSFORMER DIMMERS come in 2500, 6000 and 8000 watt sizes, 120 volts, 60 cycles A.C. Foolproof dimmers, capable of operating singly or in many combinations with interlocking to common master systems. Exclusive features include silver-surfaced brush track for low contact resistance and long, trouble-free life. Complete details in Bulletin 76.

REACTANCE DIMMERS



WARD LEONARD'S HYSTERSET DIMMER. New electronic circuits, using small current values and miniature control devices, permit grouping many dimming and switching controls in single control board for one-man operation. Various circuits can be interlocked electronically. Pre-set control permits pre-selection of two or more lighting combinations or scenes in advance. Write for Bulletin 74.

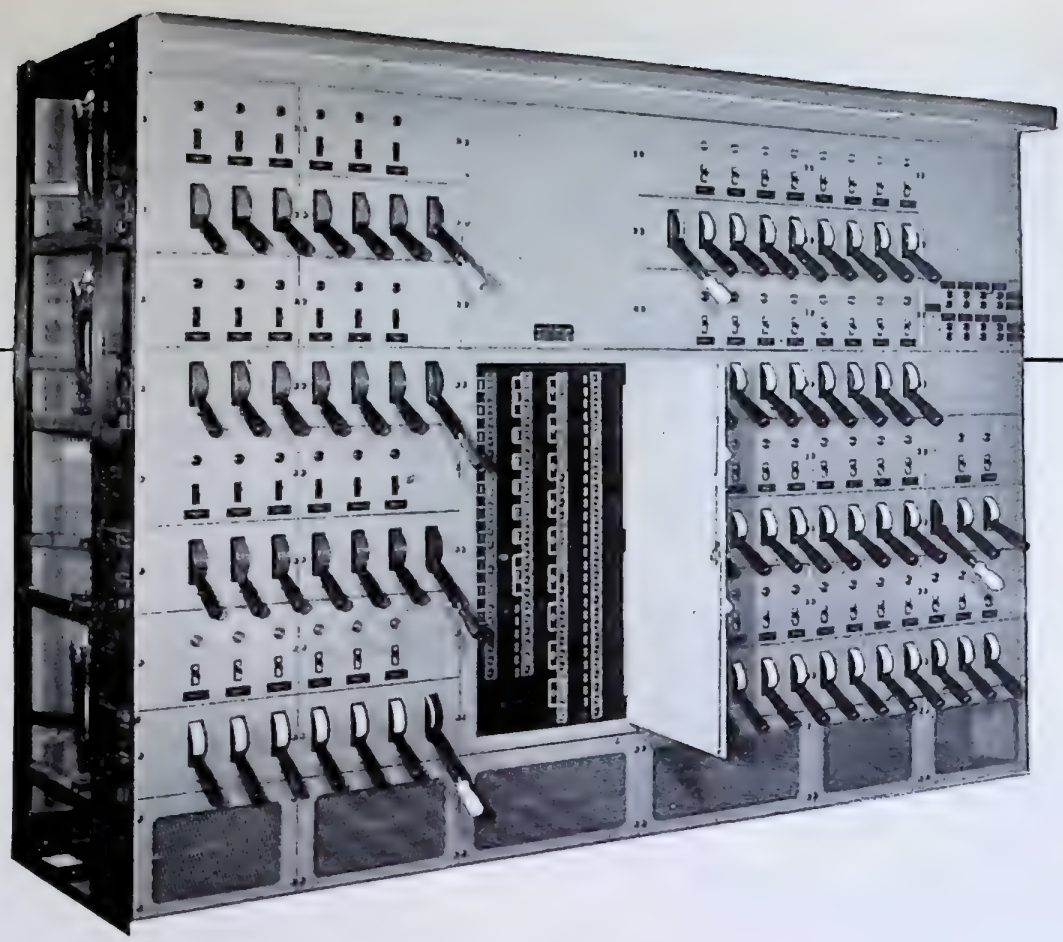
RESISTANCE DIMMERS



WARD LEONARD'S VITROHM. Inexpensive assemblies for small theaters and auditoriums, schools, churches, and lodge rooms provide low-cost, flickerless dimming. Non-interlocking, single- or multi-plate assemblies: Bulletin 71. Interlocking assemblies with group, color and grand master control: Bulletin 72.

4.36





For complete, instant control of lighting intensity

FEDERAL PACIFIC
DIMMER CONTROL SWITCHBOARDS

SPACE-SAVING design . . . controls and circuit protection equipment in one compact enclosure! Complete flexibility of light adjustment! Smooth, flickerless dimming! Maximum reduction of electrical losses! These are some of the reasons why the Federal Pacific Dimmer Switchboard is being more and more widely adopted the country over.

The Federal Pacific Dimmer Switchboard uses auto-transformer type dimmers which vary voltage to change lighting intensity . . . never wastes current by boosting resistance. It dims individual lights or any combination of circuits . . . permits the setting up of desired lighting effects in advance of requirements.

In motion picture and legitimate theatres, night clubs, auditoriums and stages of schools and colleges—wherever lighting effects must be controlled and regulated—the Federal Pacific Dimmer Switchboard brings outstanding efficiency and economy. Write for full data.

FEDERAL PACIFIC ELECTRIC COMPANY

FORMERLY FEDERAL ELECTRIC PRODUCTS COMPANY AND PACIFIC ELECTRIC MANUFACTURING CORP.

50 PARIS STREET, NEWARK 1, NEW JERSEY

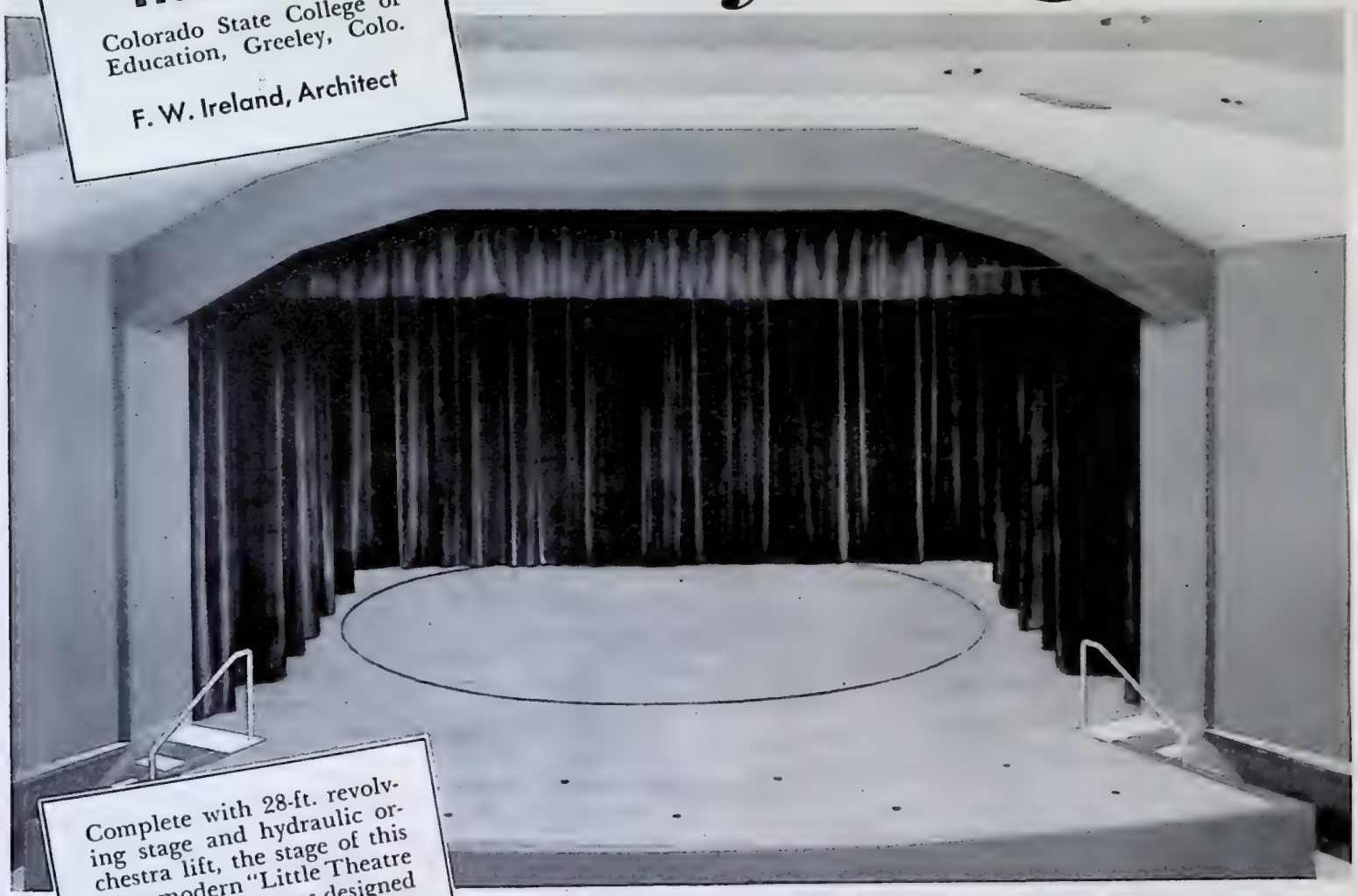
REPRESENTATIVES IN PRINCIPAL CITIES

Clancy-Designed

The Theatre in Fraiser Hall

Colorado State College of Education, Greeley, Colo.

F. W. Ireland, Architect



Complete with 28-ft. revolving stage and hydraulic orchestra lift, the stage of this ultra-modern "Little Theatre of the Rockies" was designed and installed by J. R. Clancy, Inc., to provide full flexibility, complete safety and easy operation.

Clancy-Installed

. . . your assurance of a truly modern stage

For a truly modern stage at the lowest cost consistent with complete safety and widest flexibility, take advantage of J. R. Clancy's unequalled design, manufacturing and rigging facilities. Write for complete information.

World's Largest Designers, Manufacturers and Riggers of Mechanical Stage Equipment

Any Size Stage
Any Where—Any Time
World-Wide Service

J. R. CLANCY, INC.
1010 W. Belden Ave., Syracuse 4, N. Y.



EVERY SIZE AND TYPE FOR ANY BUDGET...ANY APPLICATION

LUXTROL Light Control Equipment brings new standards of fine performance to any and every lighting installation. It provides smooth, stepless dimming, brightening and blending from full-on to blackout. Operation is cool, silent, efficient and economical. LUXTROL Controls are truly flexible; they will control any number of lamps up to their full rated capacity and can be used with incandescent, cold cathode or fluorescent lighting. Installation in either old or new circuits is simple and inexpensive.

Whether you're building or remodeling, you can be sure of better light control . . . and equipment better suited to your exact needs with LUXTROL Controls.

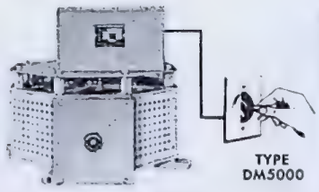
Including NON-INTERLOCKING TYPES

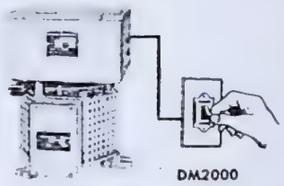
MANUALLY OPERATED

In auditoriums, single rooms and other installations where only a few circuits require dimming, non-interlocking LUXTROL Controls find their widest use. They consist of one or more units operating in unison on a common shaft. Ratings from 1,000 to 30,000 watts are offered.


TYPE D5000

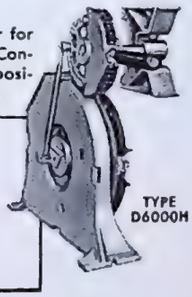

TYPE D2000


TYPE DM5000


DM2000

MOTOR-DRIVEN

For effortless operation of the larger models . . . or for convenient remote control, motor-driven LUXTROL Controls are available. They are also adaptable to positioner control from a compact, console-type board.


TYPE D6000H


TYPE D1000R


TYPE D1000H

and INTERLOCKING TYPES

Supplied in 2500 and 6000 watt ratings, the interlocking LUXTROL Controls may be operated independently, mastered or grand-mastered. They are available as units — each supplied with individual hand lever and indicating drum — or as factory framed assemblies in almost any required combination.

PLUS these Exclusive LUXTROL Developments

PACKAGED TYPES



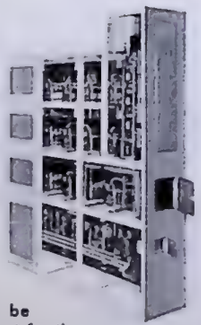
Particularly well suited for small theatres, schools, churches and other applications where expense is a governing factor, PACKAGED LUXTROL Controls provide big switchboard effects at a modest cost. Numerous models are available in ratings from 6,000 to 12,000 watts. Units may be purchased singly and others added later as finances permit.



See Superior Electric's Mobile Display when it is in your area.

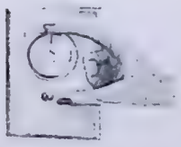
POSITIONER SYSTEM





Here is the ultimate in light dimming equipment. The Positioner System provides all the facilities of a large switchboard installation in a compact, console type control board. The selector stations can be located in the place most convenient for the operator while the motor-driven LUXTROL Controls are installed in any out-of-the-way space. This system, adaptable to both large and small installations, makes it possible to pre-set lighting effects in advance timed to coincide with the most complicated stage productions.

LUXTROL LIGHT CONTROL



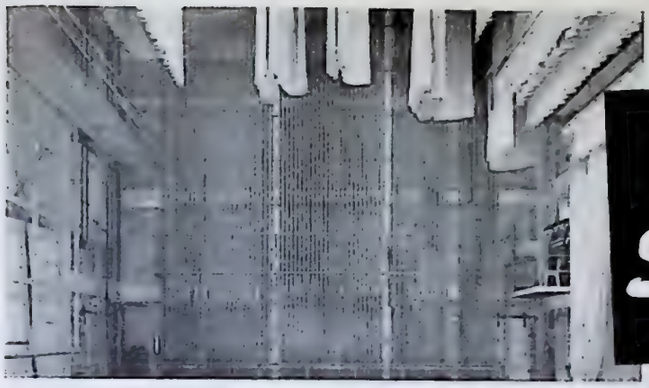
This new concept in light control is designed for mounting into a wall. It is used in place of regular wallswitches and is easy to install. Like all LUXTROL Controls, its operation is smooth and efficient. Any number of lights up to the full rated capacity of 360 watts can be controlled.

THE

COMPANY

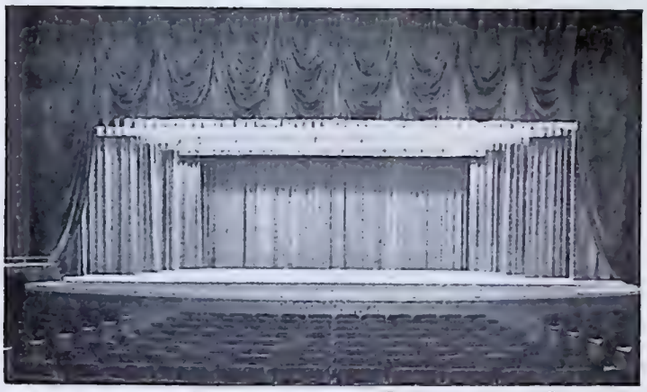
154 DEMERS AVENUE, BRISTOL, CONN.

SEND NOW FOR INFORMATION: *Literature on all light control equipment manufactured by The Superior Electric Company is available for the asking. JUST WRITE TO: 154 DEMERS AVE., BRISTOL, CONN.*



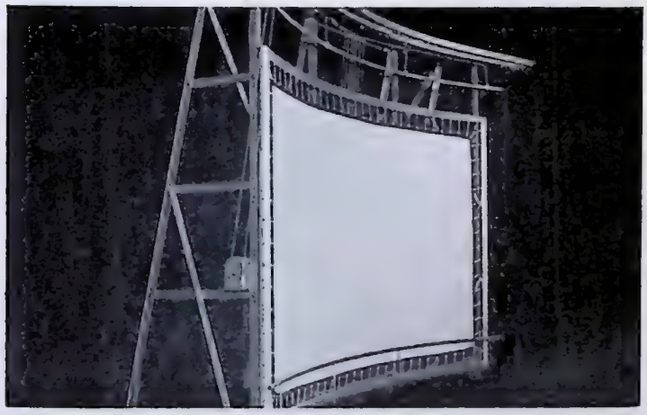
Distinctive Stage Equipment

Dade County Auditorium, Miami, Florida. Stewart and Skinner, Architects. Above: Stage Rigging, T-Bar Counterweight System. Below: Stage and Proscenium.



Knoxville Scenic Studios manufacture and fabricate in America's finest and most efficient stage equipment plant. Our service includes preparation of blueprints, showing details of gridiron construction, smoke pockets, position and operation of all curtains, cycloramas, side drapes, border lights and light bridges, sound horns, picture screens, revolving stages, stage, console or orchestra lifts. Erection and installation is personally supervised by our own installation specialists to insure the proper technical hanging of all equipment for satisfactory service.

Now...the perfected Wide Screen Frame engineered to the requirements of your house...



This front view of the sensational new Knoxville CURVA-MATIC frame shows the rigidity of construction and the graceful symmetry of the curve.

KNOXVILLE

CURVA-MATIC

Book the complete range of wide screen productions with Knoxville Curva-Matic — the world's most adaptable wide screen frame available in 5 types. Write for complete details.

- ☆ Stationary
- ☆ Flying
- ☆ Portable
- ☆ Retractable
- ☆ Flying-Portable Combination



KNOXVILLE Scenic Studios INCORPORATED

OLD MARYVILLE PIKE • KNOXVILLE, TENN

Let us work out your frame problems with

CURVA-MATIC

. . the perfected panoramic.

Creative artists and skilled craftsmen

- Stage Curtains
- Cycloramas
- Draperies
- Stage Rigging
- Wall Fabrics
- Wide Screen Frames
- Lighting
- Asbestos Curtains
- Curtain Tracks
- Automatic Curtain Controls

Resty says—

RESTFOAM

Makes Every Show a ☆☆☆☆ Hit!



Even your fussiest patrons will enjoy the show more . . . if the seats in your theater are cushioned with Restfoam foam rubber.

That means they'll come back more often. For Restfoam has plenty of box-office appeal.

Restfoam foam rubber has plenty of appeal for theater owners, too. It's your best bet for long service with low maintenance cost. And it makes upholstery fabrics last and last. In fact, it's a four-star attraction:

☆ **Gives greater comfort!** No lumps! No bumps! Patrons enjoy the firm, *natural* support of Restfoam.

☆ **Cool and clean!** Restfoam is self-ventilated by millions of tiny, interlaced air cells. It is 100% pure natural latex foam. And it contains no dust-making materials.

☆ **Keeps its shape!** Nothing to shift or slide. Nothing to pack or mat down. No broken wires to pop out. No wonder you get longer and safer service from Restfoam.

☆ **Cuts upkeep costs!** Restfoam relieves strain on covering materials. Your fabric stands up better—and longer.

So . . . if *you* want to step attendance up and costs down, find out how Restfoam can help you do it. Specify Restfoam when buying new chairs—for furniture in lobby and rest rooms, too. See your theater architect or supply dealer. Or write for details today.

HR **HEWITT-ROBINS INCORPORATED**
STAMFORD, CONNECTICUT

Hewitt-Robins Incorporated
Restfoam Division
240 Kensington Ave., Buffalo 5, N. Y.

Please send me my free copy of the "Restfoam Application Manual."

*Name*_____

*Address*_____

*City-Zone*_____ *State*_____

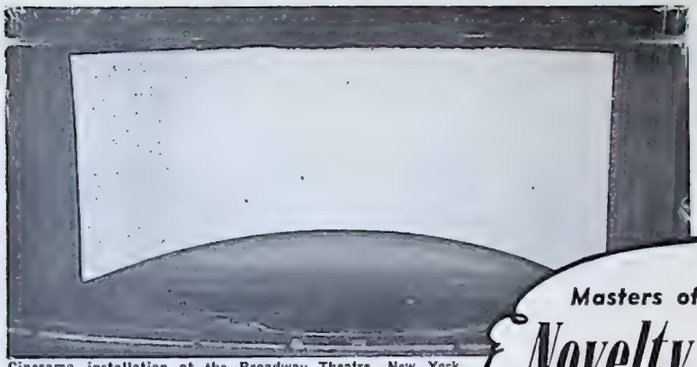
4270

SOLVED!

AT MINIMUM COST

SCREEN DRAPING and MASKING PROBLEMS

- CINEMASCOPE
- VISTAVISION
- WIDE SCREENS
- STANDARD 2-D



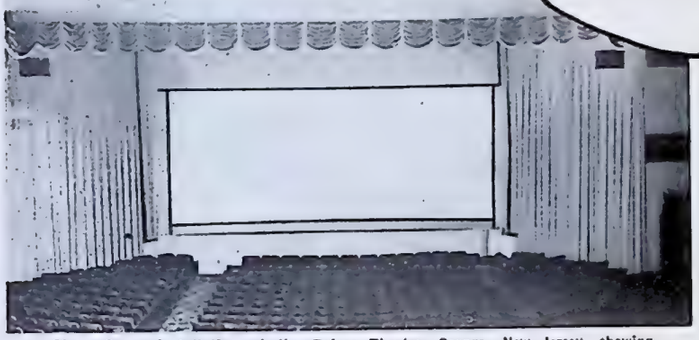
Cinerama installation at the Broadway Theatre, New York, showing the unusual and difficult proscenium treatment in the World's first Cinerama installation. A Novelty Scenic Studio installation.

Masters of the Art of Decoration for 35 Years

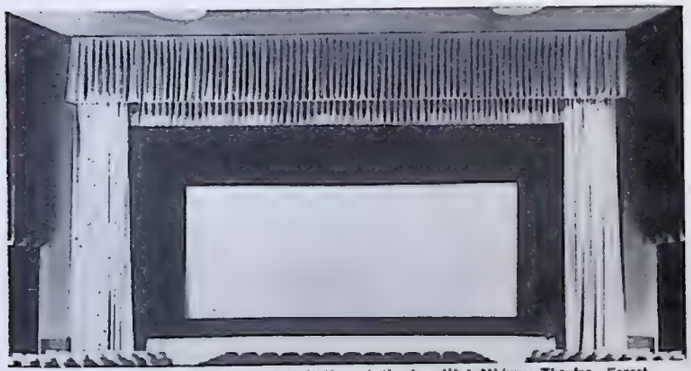
Novelty Scenic Studios, Inc.

426-432 East 91st Street, New York, N. Y.

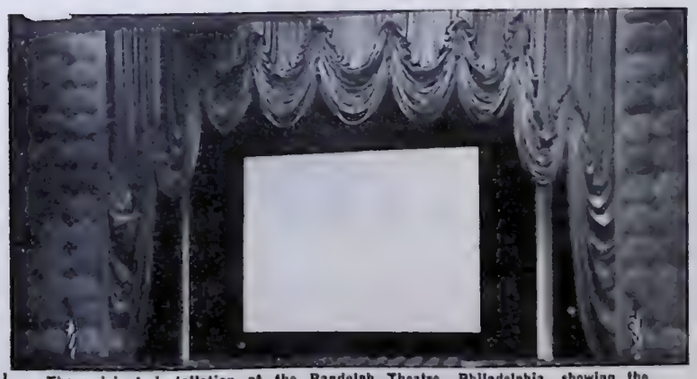
TRafalgar 6-0800



CinemaScope installation at the Palace Theatre, Orange, New Jersey, showing effectiveness of curtains, draping and masking in this type installation. Another Novelty Scenic Studio installation.



VistaVision and Wide Screen installation at the beautiful Midway Theatre, Forest Hills, Long Island. Drapes, curtains and masking combine color, beauty and efficiency producing an eye pleasing decorative effect. Another Novelty Scenic installation.



The original installation at the Randolph Theatre, Philadelphia, showing the pleasing, effective treatment with colorful contour curtains, screen masking, wall treatment of this William Goldman "showcase." A proud installation by Novelty Scenic Studios.

OLD METHODS WON'T DO!

New types and sizes of screens demand changes in prosceniums, drapes, masking, curtains, tracks and controls.

Greater light and multiple sound sources require new wall treatments to control reflection and reverberation.

These are problems which NOVELTY SCENIC STUDIOS have been solving for 35 years.

We solved them for CINERAMA!

WHETHER YOU NEED COMPLETE DECORATING OR NEW LAYOUT FOR MASKING ANY ASPECT RATIO

CONSULT US!

A Partial List of Organizations and People Served . . .

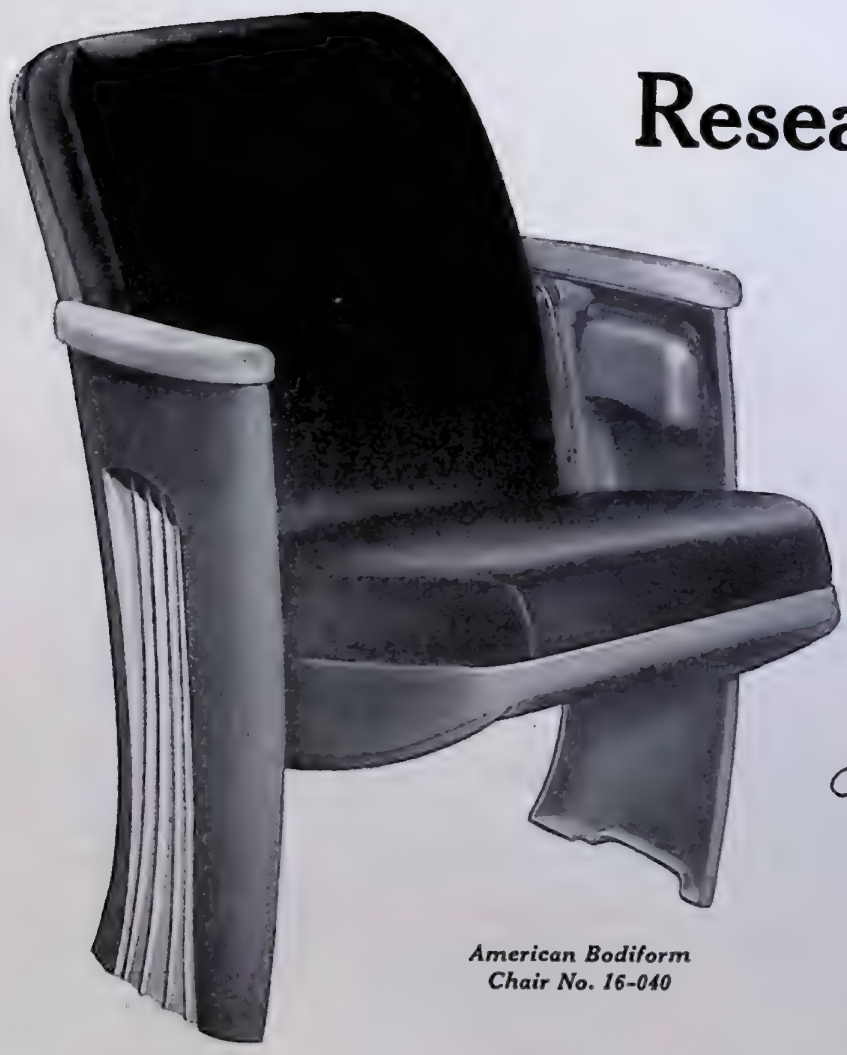
Neighborhood Thea. Ct. Richmond, Va.
Wielland & Lewis Ct. Atlantic City, N. J.
University of Wisconsin Madison, Wis.
F. D. Roosevelt Lib. Hyde Park, N. Y.
Convention Hall Atlantic City, N. J.
Public Auditorium Cleveland, Ohio
A. M. Ellis Circuit Philadelphia, Pa.
Dipson Theatres Buffalo, N. Y.
Basil Theatres Buffalo, N. Y.
Orfeon Theatre Mexico City, Mex.
His Majesty's Theatres Johannesburg, S. Afr.
Skouras Theatres New York, N. Y.
Keith-Albee Theatres Huntington, W. Va.
Community Circuit Cleveland, Ohio
City Investment Mgmnt. New York, N. Y.
20th Century Theatre Buffalo, N. Y.
Strand & Cataract Ths. Niagara Falls, N. Y.
Park Theatre Tampa, Fla.
Civic Auditorium Kalamazoo, Mich.
Nathan Yamins Ct. Fall River, Mass.
Wisper & Wetsman Ths. Detroit, Mich.
Associated Theatres Cleveland, Ohio
Scoville, Essic & Reif, Ct. Cleveland, Ohio
Famous Players Canadian Corp. Toronto, Canada
Shea's Buffalo Theatres Buffalo, N. Y.
Randforce Amuse. Co. New York, N. Y.
Brandt Circuit New York, N. Y.
Weinstock Circuit New York, N. Y.
Loyal Order of Moose Johnstown, Pa.
Interboro Circuit New York, N. Y.
Prudential Playhouses New York, N. Y.
Ted Vermes Theatres Cleveland, Ohio
Morris Mechanic Ths. Baltimore, Md. and many others.

SERVING THEATRES, SCHOOLS, CHURCHES, HOTELS AND OTHER PUBLIC INSTITUTIONS:

Wall Coverings
Decorating
Draperies
Painting
Murals
Stage Curtains
Etched Glass and Plaster
Asbestos Curtains
Curtain Tracks
Stage Rigging

Luxurious Comfort

IS PART OF THE PICTURE



American Bodiform Chair No. 16-040

Reseat with AMERICAN BODIFORM® CHAIRS

American Seating Company

WORLD'S LEADER IN PUBLIC SEATING

Grand Rapids 2, Michigan

Branch Offices and Distributors in Principal Cities

Manufacturers of Theatre, School, Church, Auditorium, Transportation, Stadium Seating, and Folding Chairs

ALSO DISTRIBUTED BY NATIONAL THEATRE SUPPLY

Fabrics for

- THEATRE DRAPES
- STAGE CURTAINS
- WALL COVERINGS
- LOBBIES



CINEMASCOPE ? **VISTAVISION ?** **WIDE SCREEN ?**

Regardless of which system you install—changes in decor are necessary. And—changes bring problems. Problems of draping, masking, wall coverings for sound control, and the selection of proper decorative fabrics to enhance the "new look" vistas offered by wide screen film entertainment.

"Know-how" of fabrics for all uses has made the Maharam organization the first choice of architects, scenic studios and theatre owners throughout the country and in many parts of the world. They know that Maharam sets the pace in the creation of new and distinctive designs and weaves. And they know that Maharam can work out solutions to new and challenging technical problems.

Whatever your problem—be it new drapes for the proscenium, decorative wall covering, stage curtains or the revamping of your decorative schemes to solve new problems, you can call on Maharam with confidence that you will obtain the best possible in advice and in fabrics.

VELOURS

PLUSHES

DAMASKS

SATINS

METAL CLOTHS

FIBRE GLASS FABRICS

MODERN PRINTS

And a Complete Range of Lobby Decorative Fabrics

(All Fabrics Available Flame-Proofed)

●

WHATEVER YOUR FABRIC NEEDS — BE SURE TO COUSULT US!

"The House of Service"

MAHARAM FABRIC CORPORATION.

NEW YORK, 130 West 46th Street

CHICAGO, ILL., 115 South Wabash Street

LOS ANGELES, 1113 South Los Angeles Street

The Seat of Comfort is in the *Cushion*



TC 706

The famous "Rocking Chair" Loge with accent on Comfort and Luxury. Spring base principle permits comfort at *every* sitting position.

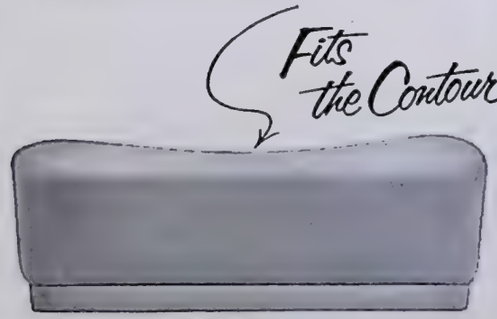
HEYWOOD-WAKEFIELD

EST. 1826

The New

"CONTOUR"

Formed Rubber Cushion

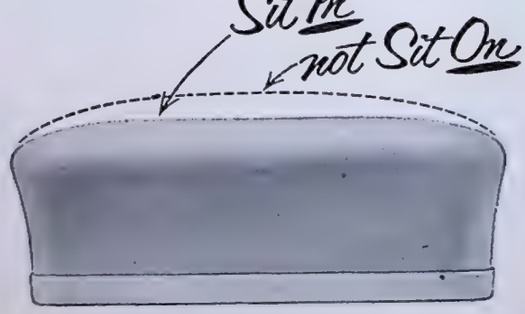


Designed to make Heywood-Wakefield theatre seating as comfortable as the average patron's own easy chair at home . . . the luxurious new "Contour" Formed Rubber Cushion that *conforms to* the contours of the occupant's body as he sits down in its luxurious depth . . . assuring utmost comfort regardless of how he shifts his weight or position.

The New

"SIT-IN"

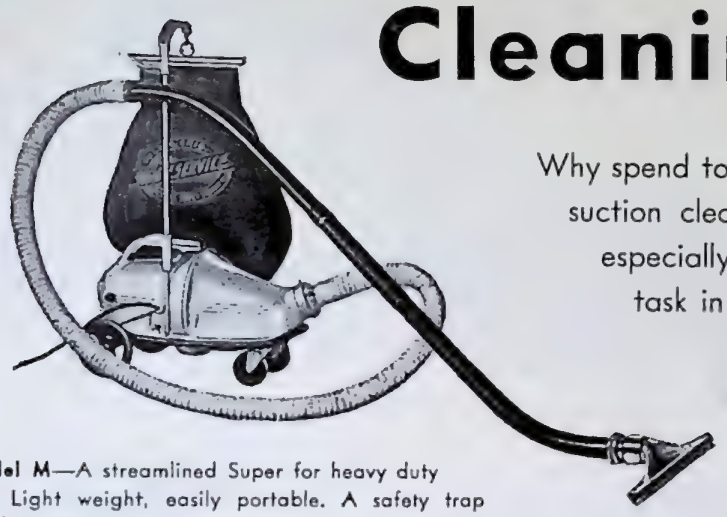
Coil Spring Cushion



Occupant sits *deep down in* not high up on this outstandingly comfortable new coil spring cushion . . . whether he sits in the middle, on the side or way back in the seat, he'll enjoy relaxing comfort at all times. This is just one more fine example of Heywood-Wakefield engineering skill, proving the seat of the comfort is in the cushion.

HEYWOOD-WAKEFIELD COMPANY *Theatre Seating Division, Menominee, Michigan* • Sales Offices: Baltimore, Boston, Chicago, New York

Money Saving Cleaning Equipment



Model M—A streamlined Super for heavy duty use. Light weight, easily portable. A safety trap catches metal and other solid objects picked up by the floor tool, without damage to the fan or motor.

Why spend too much of your profit for cleaning? Super heavy-duty suction cleaners are money saving machines because they are especially powered and tool-equipped to do every cleaning task in your theatre quickly and thoroughly.

Brooms, brushes and ordinary vacuum cleaners can't begin to do the cleaning up necessary after hundreds of people track in dirt, mud slush, scatter popcorn, candy wrappers and other debris around lobby, restrooms and auditoriums, day after day. One operator and a Super can.

These are Featured Super Tools

SUPER SCREEN BRUSH

Cleans sound holes and screen. Insures top reproduction of pictures and sound track. Screen lasts longer.

SUPER BLOWER ELBOW

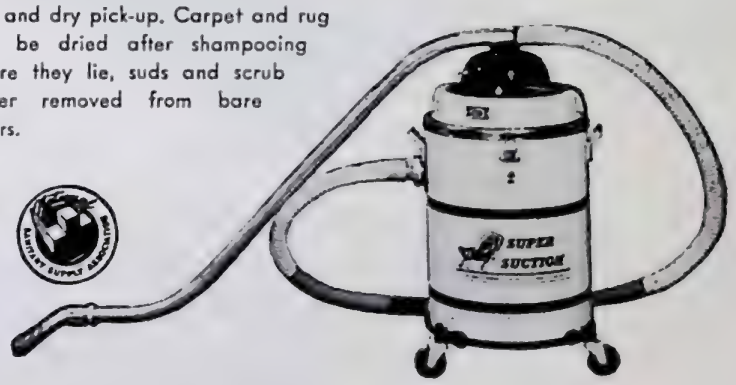
Boosts popcorn, papers, boxes and other debris out from under seats, from behind and under counters at concessions and popcorn machines for easy disposal.

SUPER HI-UP TUBE

Adds 10, 20, 30 feet to reach of operator. Use any number of 5-10-foot sections available. All high places, objects, ornamentation can be cleaned without climbing risky scaffolds or step ladders. Also used to clean below floor areas.

Leading wholesalers and supply houses sell and service the Super. Ask your supply dealer for a demonstration. Write for complete data.

Model BP-1—General purpose, heavy duty cleaning with minimum noise level, plus wet and dry pick-up. Carpet and rug can be dried after shampooing where they lie, suds and scrub water removed from bare floors.



- Do all general cleaning and blowing.
- Clean 100 air filters in 15 minutes
- Dry floor coverings after shampooing right where they lie. Take up suds from bare floors, slush and wet dirt from lobbies.
- Clean anywhere anytime without disturbing patrons.
- Do high up-and-over cleaning of cornices, ornamentations, etc.



"Once Over Does It"

SUPER SUCTION®

SINCE 1911

"THE DRAFT HORSE OF POWER SUCTION CLEANERS"

NATIONAL SUPER SERVICE CO., INC.

1947 N. 12th St., Toledo 2, Ohio

Sales and Service in Principal Cities

In Canada: Plant Maintenance Equipment Co. Toronto, Montreal, Vancouver



Theatremen with Vision

who take full advantage of the opportunities afforded by the "new era" in picture presentation will undoubtedly include new modern, comfortable seating in their equipment planning.

Ideal offers the widest choice of seating in the world — serviceable cast iron or steel construction; full upholstered, padded or spring backs; a variety of attractively styled end standard designs; upholstering materials, finishes and colors to appeal to every taste; chairs from the lowest priced to the most luxurious — all the biggest values in theatre seating. Ideal also offers a line of comfortable, serviceable, safe, all-weather chairs for drive-in theatres for attracting pedestrian business.



Eight separate and distinct lines from which to choose.

A chair to meet any budget.

Either steel or cast iron standards or a combination of both.

Assured comfort and durability with essential features not found in other chairs.

Maintenance reduced to a minimum.

Free Planning Service without obligation.

On display at your independent supply dealer.

Literature on request.

IDEAL SEATING COMPANY 523 Ann Street, N.W. Grand Rapids, Michigan

PROJECTION *and* SOUND

1954-55

Installing CinemaScope

Thorough and Detailed Review of Equipment Required, Installation Procedures, Maintenance, and Operating Practices for CinemaScope

This literature has been prepared to provide the distributor, exhibitor and operating personnel with some basic understanding of CinemaScope, to indicate equipment changes, to describe installation procedures, apparatus adjustment, differences in handling practice, precautions which should be observed and certain operating features. These notes have been carefully prepared on the basis of all present knowledge with the idea of facilitating an orderly preparation and smooth operation for a showmanlike presentation of CinemaScope product. It is likely that these preliminary instructions will be subject to some modification from time to time as the occasion warrants.

WHAT IS CINEMASCOPE?

CinemaScope is a completely engineered system for the practical presentation of wide screen pictures combined with true stereophonic sound and so designed as to provide the greatest approach to realism in motion picture story telling which has yet been achieved. This realism is possible because the CinemaScope scheme permits using lenses during the photography which gives the most natural perspective; the angles of view in the presentation of CinemaScope approach that to which we are accustomed in life, and the effect of stereophonic sound is to assist in bringing the performance to the stage or area before the audience. All of the factors of depth perception except stereoscopic vision are used but two inter-locking projectors and films are not required. CinemaScope is not a so-called 3-dimension system. CinemaScope is not a temporary expedient of wide screen presentation such as has been used to some extent on product which has not been produced with this in mind, nor is the stereophonic sound associated with CinemaScope any engineering compromise to hurry release or to be first in the field for exploitation purposes. All films produced by 20th Century-Fox in CinemaScope have been specifically staged and photographed with this medium in mind.

The screen shape (not just the size) has been chosen as the closest practical approach to peripheral vision as it seems possible to do today, without putting a considerably greater cost burden on the exhibitor than is required for CinemaScope. It can be demonstrated that CinemaScope gives an excellent presentation for nearly all the seats in a theatre. Further, screen shape is sufficiently different from past product so that it is noticeable to the audience rather than merely going part way in this regard.

Not A Ribbon of Picture

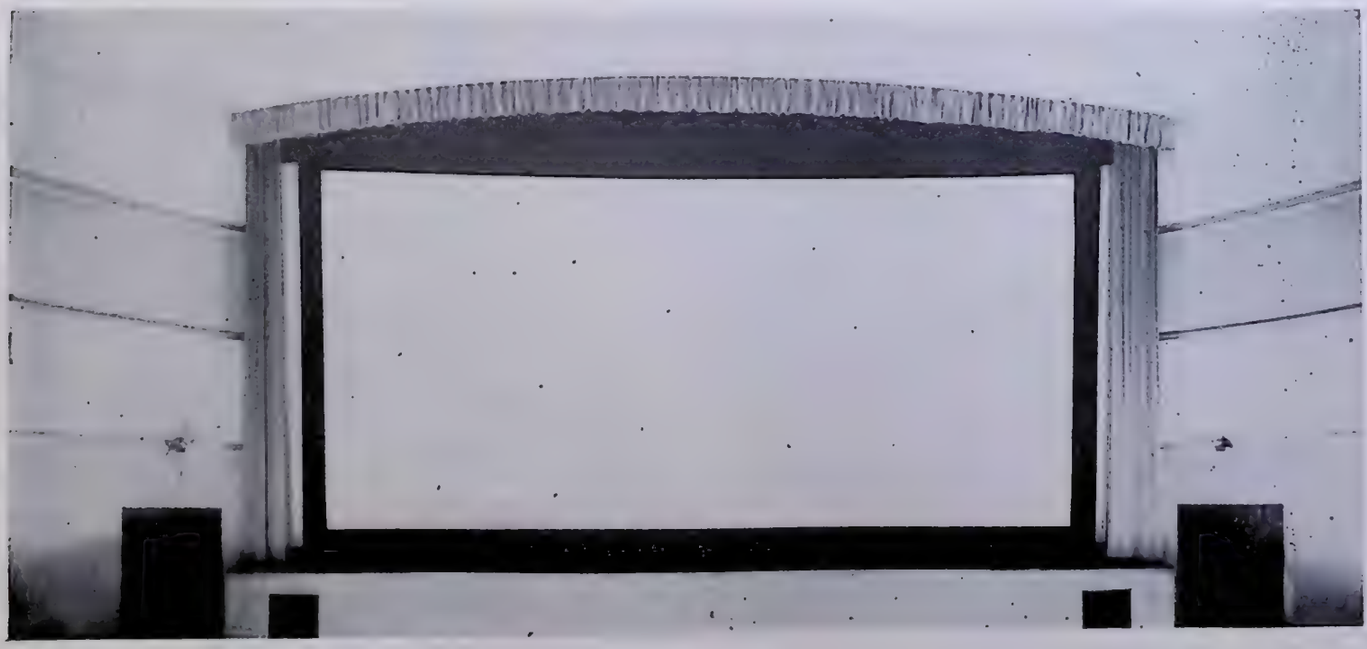
The CinemaScope picture has sometimes been referred to as a "ribbon of picture"; this is a false statement because it strongly implies that the picture has very little height and great width. The height of any picture in the usual theatre is determined by the sight lines of the house and it is emphasized that every effort should be made to continue at least the same picture height in the theatre as presently is used. No picture system or any other aspect ratio can put any greater picture height in the theatre than is dictated by the sight lines. Once the height is fixed the

---

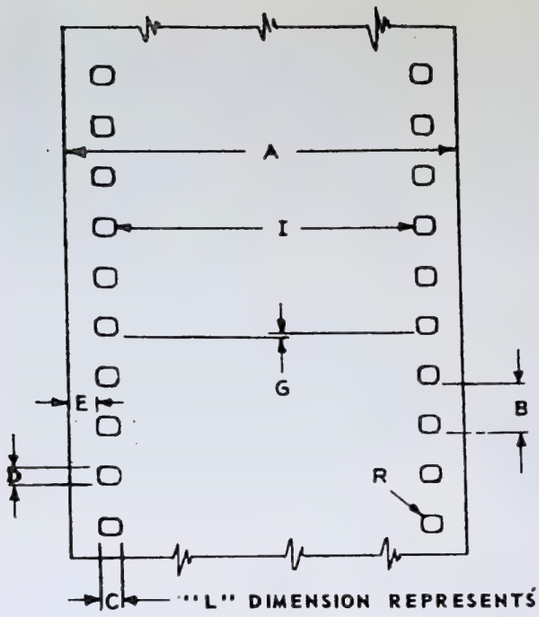
BRIEF: ***The motion picture exhibitor has been belabored with many conflicting statements and ideas concerning large screen projection . . . stereophonic sound . . . and other new production technique.***

CinemaScope is ready for the theatre . . . and it is now essential to dispose of any misunderstandings with clear . . . concise information . . . This article . . . prepared by the Research and Development division of 20th Century-Fox Corporation . . . under the direction of Mr. E. I. Sponable . . . answers the questions of the exhibitor . . . provides data . . . states equipment requirements . . . and furnishes technical information that will be of interest and importance to the theatre operator who has not yet installed this system.

Although it is presently possible to obtain CinemaScope in various forms . . . including single track magnetic sound prints . . . single track optical sound prints . . . and standard 2-D prints . . . this article goes on the assumption that the full CinemaScope and stereophonic sound system will be used . . . since this covers almost any situation that might come up in any of the other modifications of the full CinemaScope process.



THE AMES Theatre, Dayton, O., with a typical CinemaScope screen installation. This process has done much to recreate interest in films.



DIMENSION	INCHES	MILLIMETERS
A	1.377 ±0.001	34.98±0.03
B	0.1870±0.0005	4.750±0.013
C	0.078 ±0.0004	1.98 ±0.01
D	0.073 ±0.0004	1.86±0.01
E	0.086± 0.002	2.18±0.05
G	NOT >0.001	NOT >0.025
I	1.049± 0.002	26.62± 0.05
L	18.70 ±0.015	474.98±0.38
R	0.013	0.33

"L" DIMENSION REPRESENTS THE LENGTH OF ANY 100 CONSECUTIVE PERFORATION INTERVALS.

FIGURE 1 shows the film dimensions after the necessary sprocket hole size, spacing changes.

width for CinemaScope is determined by the aspect ratio, i.e. by multiplying the height by 2.55. Under the stated circumstances the resulting picture will be roughly twice as wide as the old picture for the same height. If a situation exists in a particular theatre which positively limits the picture width, then the height is determined by dividing the maximum width by 2.55. In dealing with a number of small theatres it has been found that, with thought and engineering ingenuity, it was possible to install a screen of considerable width and the resulting picture height for CinemaScope was essentially the same as the prevailing height in the theatre. Actually, if the existing projection lens is used with CinemaScope the resulting screen image will have greater height than the conventional picture because the 35mm. film is being used to greater advantage by employing a frame with 19 per cent greater height.

The story telling must be handled differently and approaches that of legitimate stage technique but still maintains the unique feature of motion pictures where scenes can be rapidly changed at will. The closeup is used less frequently but is as important as ever and the intimate scene is not ruled out.

In photographing the picture a special optical attachment, technically described as "anamorphic," is added to the front of the conventional camera lens. The anamorphic attachment "looks" at a wider picture than the conventional lens but does not in the least way affect the height, the result being as though the picture were photographed in a horizontal direction with a very wide angle lens but with an ordinary lens in the vertical direction. Observation of the image on the negative, or the print made therefrom, will show that the image is squeezed in the horizontal direction. All objects seem to be thinner than they should be. By adding to the projector a similar optical attachment in combination with the existing projector lens, which has precisely the opposite effect to the taking lens, the image is restored optically to its correct proportions and the picture on the theatre screen is a true reproduction, in all of its proportions, of the original scene. In this way it is possible to get a very wide picture on a standard piece of 35mm. film and use all of the available area of the film. In order to provide as large an image on the film as possible, to reduce the magnification required in the theatre, to maintain resolution, to minimize grain and to provide space for the sound tracks, it has been found entirely practical and good engineering to reduce the size of the sprocket holes on the film. The reader can easily observe that the sprocket holes have less width than the present standard film and that they are located near the outer extremes of the existing sprocket holes. (See Figure 2.)

Stereophonic sound, properly recorded and projected, adds a great deal of realism to the picture presentation. It not only has features of direction; that is, sounds appear to come from where the source is seen on the screen, but in addition to this the perspective, the acoustic character of the space around the performers, the overall sound quality and naturalness are greatly improved. Provision has also been made in the CinemaScope system for the use of auditorium, or surround, speakers at the exhibitor's option for special effects when the producer and/or the exhibitor feels that such effects add sufficiently to the value of the picture entertainment. Since a whole new sound system is involved in this case, from producing through exhibition, advantage has been

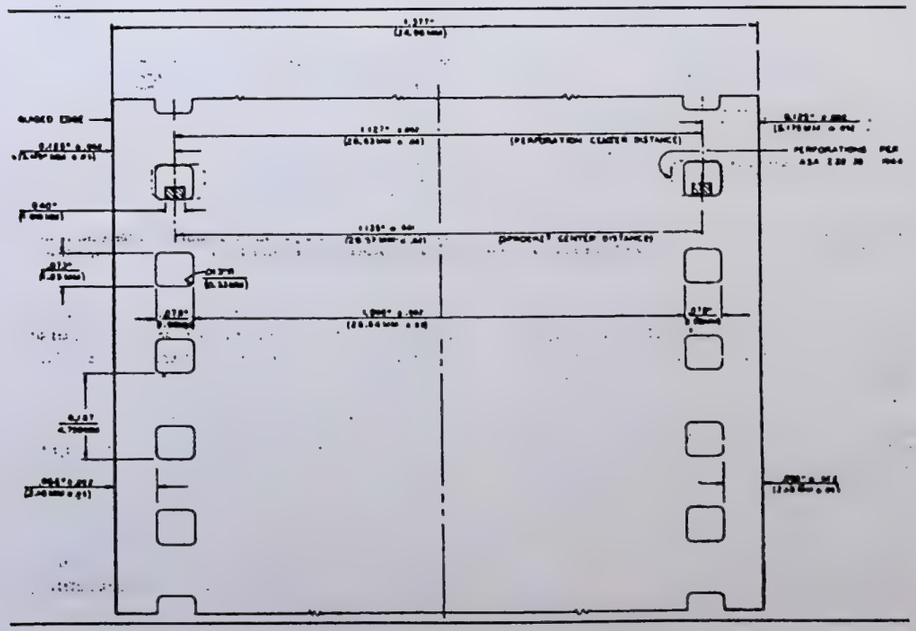


FIGURE 2 shows designs produced to insure that new sprockets will handle all types of product.

taken of this opportunity to introduce magnetic type sound recordings by which means it is possible to provide in the theatre better technical performance than can be had with the present optical systems.

PROJECTION EQUIPMENT

Because of the change in the film standards, the amount of space used by the image, the kind of image and stereophonic sound, certain additions to and modification of the booth equipment must be made. These are as follows:

Projection Sprockets

The sprocket hole sizes on the film and their relative spacing have been changed. The film dimensions are shown in Figure 1. This requires that all of the sprockets and perhaps some of the keepers and pad rollers must be changed. By inspection of Figure 2 it will be seen that the designs have been produced in such a manner that the new sprockets will handle all existing and past product except, possibly, badly shrunk nitrate film. It is obvious that with the new sprockets *it is not necessary that the projectionist change these to project any other product which presently exists, but it is imperative that CinemaScope product is not run until such sprocket change has been effected.*

In view of the better technical art available today, all of the tolerances for shrinkage and manufacture have been minimized and it is important that the intermittent sprocket be accurately lined up with the edge guiding element in the projector so that the sprocket tooth nearest the guided edge will engage the perforation in the center of the hole. The adjustment of pad and keeper roller clearances should be carefully made according to manufacturer's specifications.

All new parts, as well as all parts of the reproducers, should preferably be demagnetized *after* rather than before installation to eliminate residual fields which result from manufacture or handling. Whenever mechanical work is done on the magnetic reproducing head, these parts should be demagnetized.

As at present, a take-up adjustment that is too tight will cause nicking on the back edge of the perforation, and, therefore, this should be watched. Large hub reels and slow starting motors minimize this possibility.

Aperture

The size and placement of the CinemaScope image on the film is different from the present standard size and position and hence a new aperture plate is required (See Figure 3.). The standard size of this aperture plate is 0.912 by 0.715 inches and a plate with an opening of these dimensions may be used if the projection angle is low so that the small amount of picture keystoning that occurs might be taken care of by the screen masking. In the case of steep projection angles, it will be necessary to obtain an aperture plate with somewhat smaller dimensions of the opening to permit shaping of the aperture to correct the larger amounts of picture keystone. The method of correcting for horizontal and vertical keystone is the same as now practiced whereby the top edge of the aperture is made shorter than the bottom and the sides sloped to meet the lower edge. In addition it may be found desirable also to correct for the projector offset from the screen center line, and in this case, one side or the other will be longer. With a curved screen as used for CinemaScope, the bottom, and often the top, of the screen picture will be curved. Should this curvature be considerable it is also desirable to shape the aperture top and bottom to obtain picture edges parallel to the masking. Exaggerated drawings of typical plates are shown in Figure 4. Because of the large magnification in the horizontal direction filing of the plate for correction must be very carefully done. For example, a picture 50 feet wide is about 600 times the film image size, therefore, ten thousandths of an inch in the horizontal direction on the plate would make a six-inch change in picture.

Also, in some cases, due to the larger aperture, there may be obstructions to the light path in the projector. These will be observed as loss of light or fuzzy edged shadows around the picture periphery. In some projectors the obstruction can be the light baffles or the light beam openings in the castings or housings. Correction may require minor mechanical work to clear these openings.

With the CinemaScope attachment on a long focal length lens it may be found necessary to extend the front shutter and/or shutter guard on some projector models; or, if it is more convenient, a single rear shutter could be used as has been done in the past.

Sound Heads

The magnetic sound heads to be supplied by all manufacturers will be installed between the upper magazine and the top of the projector casting. Because of this arrangement, the picture precedes the sound on the composite film and a standard displacement of 28 frames has been adopted. Therefore, adaptor plates must be used on the film path length, between the picture aperture and sound pickup head, adjusted to meet this offset on the various models of projectors. It may also be necessary to change the upper magazine type or use an adaptor plate to fit the magazine to sound head. The specific equipment situation should be investigated at the time of ordering sound heads and other parts to avoid later delays and troubles. In some cases, as with old or orphaned equipment, the installation may require some mechanical work on the projector to permit the installation of the sound head.

Miscellaneous

It is presumed that the respective equipment manufacturers will furnish parts or instructions to the theatre installer or service man to take care of peculiarities in their designs which might damage the magnetic sound tracks, result in excessive wear or cause abrasions or other marks in the picture area.

Film Handling Equipment

Film splicers ordinarily are equipped with register pins and these must be changed or new equipment obtained to handle CinemaScope film. The exhibitor may undertake to make the small mechanical change himself, using the facilities of some local shop or by returning the apparatus to the manufacturer, or

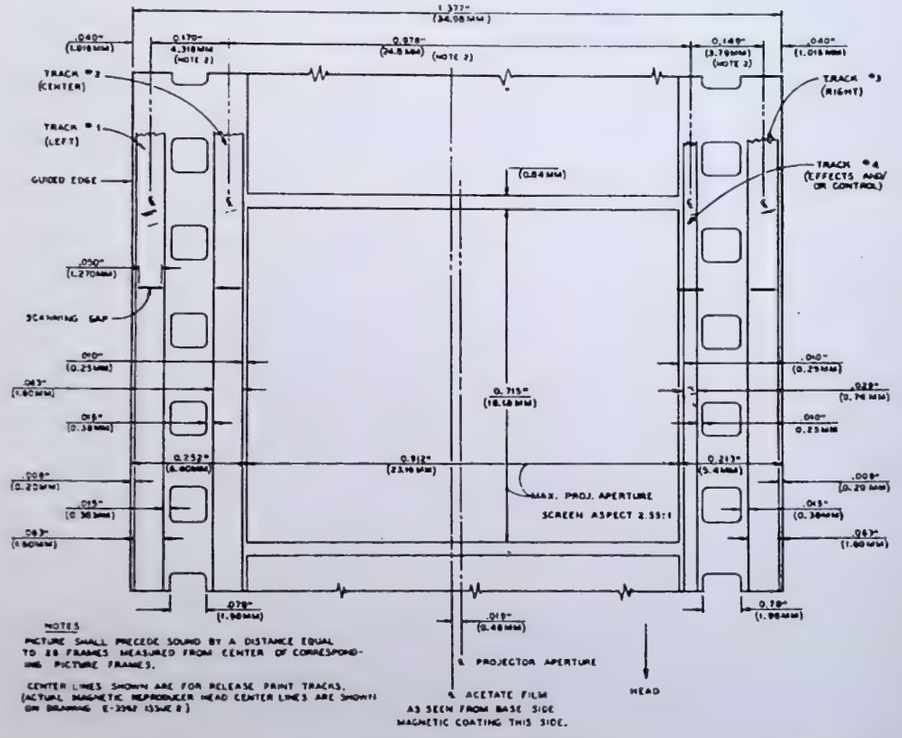


FIGURE 3 SHOWS that the size and placement of the CinemaScope image on the film is different from the present size and position, and hence a new aperture plate is required for proper projection.

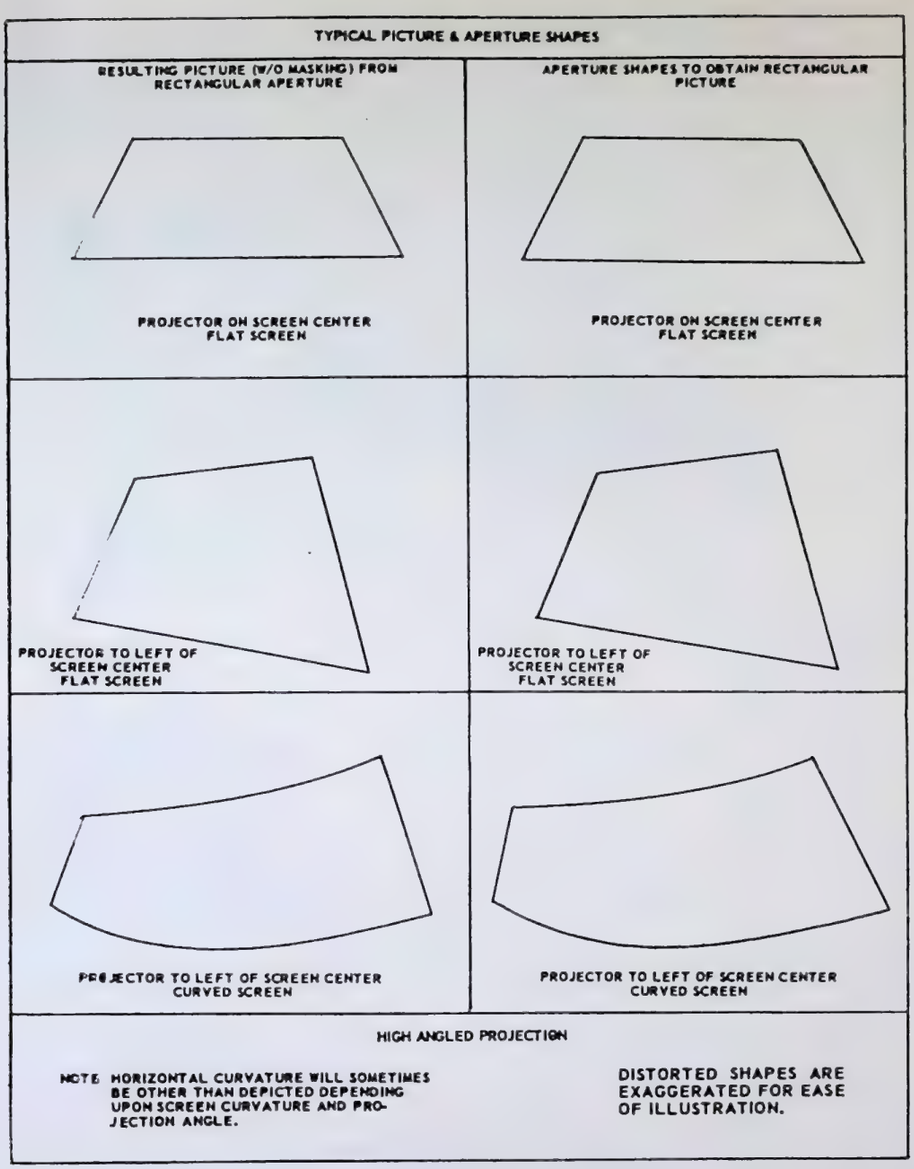


FIGURE 4 *offers exaggerated drawings of typical aperture plates after they have been properly shaped for a curved projection screen.*

by the purchase of new equipment. The precise methods available will depend upon the policy of the manufacturer or supplier and the desire of the exhibitor.

Sprocket-driven footage counters must have the sprocket tooth width and spacing modified. With most devices of this kind it is sufficient to machine off the inside surfaces of the teeth. If the dimension at the outsides of the sprocket teeth does not exceed 1.167 inches and the dimension between the inside faces of the sprocket teeth is not less than 1.087 inches, a satisfactory sprocket will be obtained. The exhibitor may elect to obtain modification parts or new sprockets from the equipment manufacturer or any other source available to him. It is desirable, but not mandatory, that aluminum reels be used, particularly when using 2,000 foot spools. Aluminum reels, particularly the cast versions, generally maintain their shape and there is no possibility of introducing noise into the magnetic sound tracks because of incipient magnetization of the reel. It is strongly recommended that badly misshaped reels not be used since they can easily cause uneven winding which aggravates the possibility of edge damage. Wear of the magnetic reproducer heads is accelerated by dirty film. The exhibitor can help materially by keeping his equipment in such condition that the prints will remain clean while in his possession. Further, it is sensible practice to handle the film in a clean place, not let the film lie or rub on tables or floors where dirt is readily picked up.

CinemaScope Attachment

The CinemaScope optics have been designed as frontal attachments to the regular projection lenses, and represent an approximate six and one-half inches of extension beyond such projection lenses of a diameter of 2-25/32 inches, and an approximate nine and one-half inches in installations using projection lenses of a diameter of four inches. At the present time, projection lenses of focal lengths of 5.00 inches or less are furnished in barrel diameters of 2-25/32 inches, and projection lenses in focal lengths of 5.25 inches and over are furnished in barrel diameters of 4.00 inches, though in older types these longer focal length lenses appear in the smaller diameter barrels. It is recommended, however, that this latter type be replaced by new, higher quality, high-speed lenses. Some present projection lenses may not be of sufficiently high quality to permit the undistorted projection of the CinemaScope picture and replacement of such projection lenses is desirable, and may be essential. Should the theatre desire a change in picture height additional projection lenses may be required, and these should be of high quality and have a flat field. In the larger sizes, the CinemaScope attachment is supported by brackets. The adjustments for the CinemaScope optical unit are as follows:

Adjusting for Projection Distance

Hold the attachment in the left hand with the front of the unit towards the right. Unlock the adjustment by loosening the red colored ring. Rotate the large diameter knurled uncolored ring so that the top turns away and continue the rotation until the end is reached but do not go against the end with much force. Turn the whole unit until you locate a short red line, parallel to the axis and on the same part of the assembly as the uncolored ring. Hold the uncolored knurled ring from turning and rotate the left end of the assembly so that the top moves away until the short red index line is opposite the red line on the rotating part which has the number 50. Note that another red line crossing the line marked 50 at a right angle, and making a plus (+) sign, is just visible, and that there are no other crossed lines to be seen. *If the attachment were left in this adjustment it would be properly set for a projection throw of fifty feet;* the numerals indicate the distance from the projector to the screen center. The setting and the unfolded scale for both models are illustrated in Figures 5 and 6. Continue the rotation past the intervening numbered lines until the next set of crossed lines appears at the number 60, which will be the next number higher than 50. When the short index line and the numbered line are directly opposite, the lens is adjusted for a 60 foot throw. Should a projection distance somewhere between 50 and 60 feet exist then estimate the correct setting between the two marks, as for example, if the throw were 53 feet the index line should be set about 3/10 of the distance from 50 to 60.

For throws greater than 60 feet, continue the rotation as before, watching for a crossed line to appear at that number which is just smaller than the projection distance and the next set of crossed lines would be greater than the required setting. Reset to the smaller number, that is, the one closest to but less than the throw. Estimate the setting between the two closest numbers, one lower and the other higher, as previously described and lock the adjustment by tightening the red colored ring.

The picture must be carefully leveled by projector adjustment before the attachment is applied. *The attachment must never be used as a means to correct picture tilt.* The CinemaScope at-

tachment is now ready for assembly with the regular projection lens and installation of both into the projector. A final test of the adjustment is described later. It must be clearly understood that once the attachment has been properly adjusted it needs no further attention in this regard unless it is moved to some other equipment or changes in projection throw are made.

The setting for the projection throw is not a focusing adjustment; it merely adjusts the astigmatism of the attachment so that uniform definition is obtained over the whole screen area. The combination of the projector lens and CinemaScope attachment should next be rotated so that vertical lines in the center of the screen appear vertical and focusing of the projector lens is then accomplished in the usual manner by use of the customary knob and screw.

Under no circumstances should the attachment adjustment be changed as the projection lens and attachment are focused, except as described in the following:

The accuracy of the setting of the CinemaScope attachment can be checked at the time of installation by turning the focusing knob on the projector so that the images go out of focus slightly in each direction and observing that the horizontal and vertical lines of the image go out of focus simultaneously and at the same *rate*. For example, if turning the focusing knob clockwise should make the horizontal lines fuzzy but the verticals should get a little sharper before becoming fuzzy, then adjustment of the CinemaScope attachment is indicated. Unlock the red clamping ring and turn the uncolored knurled ring slightly in one direction and repeat the in-and-out of focus test to see whether the change in horizontal and vertical lines occur together. If not, turn in the other direction slightly beyond the initial setting and recheck. When the best adjustment is found by this trial method lock the setting with the red clamping ring.

It is very important that great care be used in this test and, in evaluating the screen result, it should be remembered that the scales on the barrel were placed thereon in manufacture of the unit and suitably tested. If, after making this test carefully, and rechecking to make sure the observations are correct, the setting is different from the projection distance marked on the scale by more than five per cent, then the attachment should be returned for inspection.

Short focal length lenses require adaptor rings between the front of the lens and the CinemaScope attachment to assure that the latter will clear the head castings. These will be obtainable for the CinemaScope lens from the equipment suppliers. Also, since the short lenses are fitted quite deeply within the projectors there may be vignetting, or interference, at various places in the light path. The obstructions must be removed, either by filing or with redesigned parts.

The CinemaScope attachment is a high quality optical device and the glass surfaces have been treated to reduce reflections at the glass-air boundaries. This tends to minimize flare, improve contrast and reduce light loss. When required, it should be cleaned with lens tissue and an appropriate lens cleaning fluid, the same as any other high quality optical element.

Projection Ports

Obviously, since the picture is approximately twice as wide for a given height as the past standards, it will usually be found that the projection port must be widened out by an amount equivalent to the width of the existing projection beam measured at the auditorium side of the port. A means to roughly calculate this is as follows:

(a) Multiply the distance of the face of the projection lens from the outer face of the wall of the projection booth (in inches) by 2.00;

(b) Divide the above result by the focal length of the projection lens (in inches);

(c) To this result add 4 inches

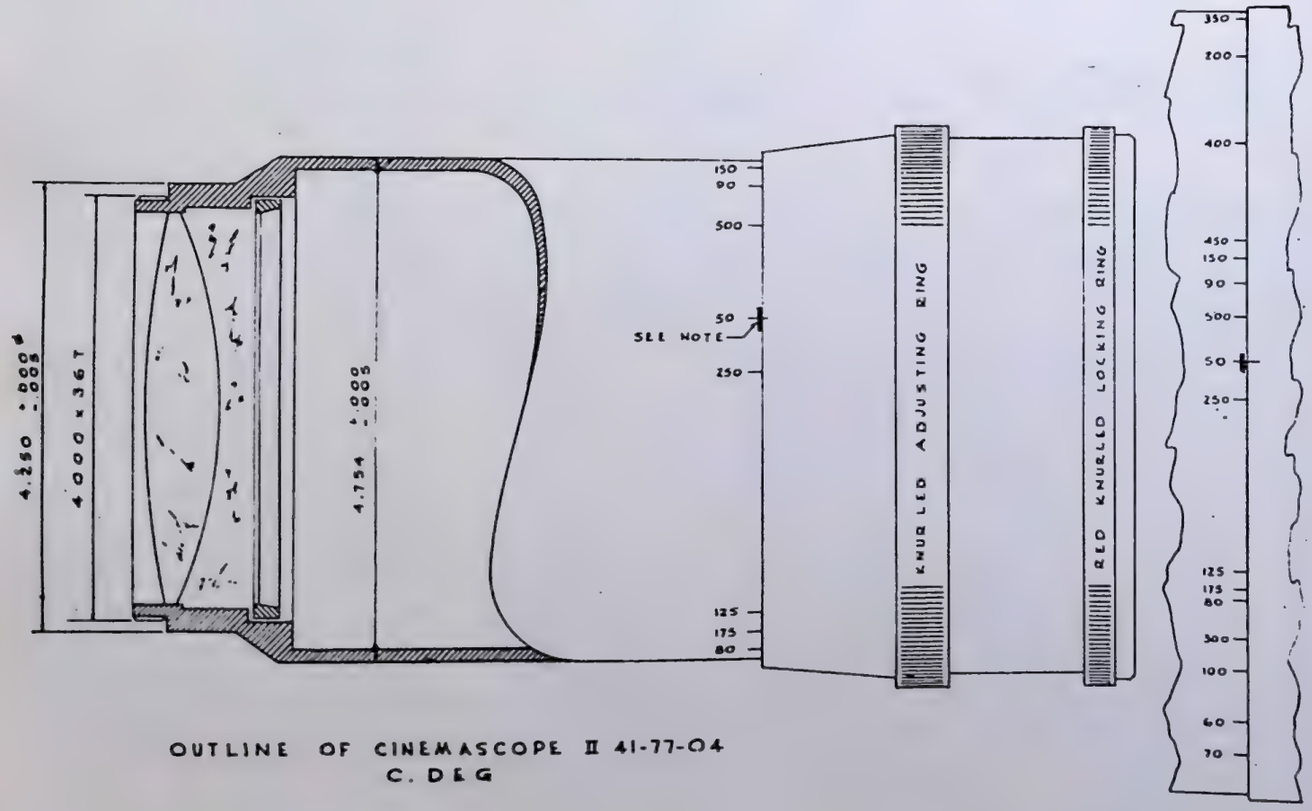
For example:

If the distance is 25 inches and the focal length is 5 inches

Then (A) = 25 × 2.00 = 50.00 inches
(B) = 50.00 ÷ 5 = 10.00 inches
(C) = 10.00 + 4 = 14.00 inches

or the *minimum* width of the port opening. In case the light beam passes through the wall of the booth at an angle thereto, the computed width must be increased to compensate for the angle and the thickness of the wall. For completeness, it should be noted that the port top or bottom, or both, might require change if the screen image height has been increased. When glass is used

FIGURE 5 offers information important when a CinemaScope lens attachment is being installed.



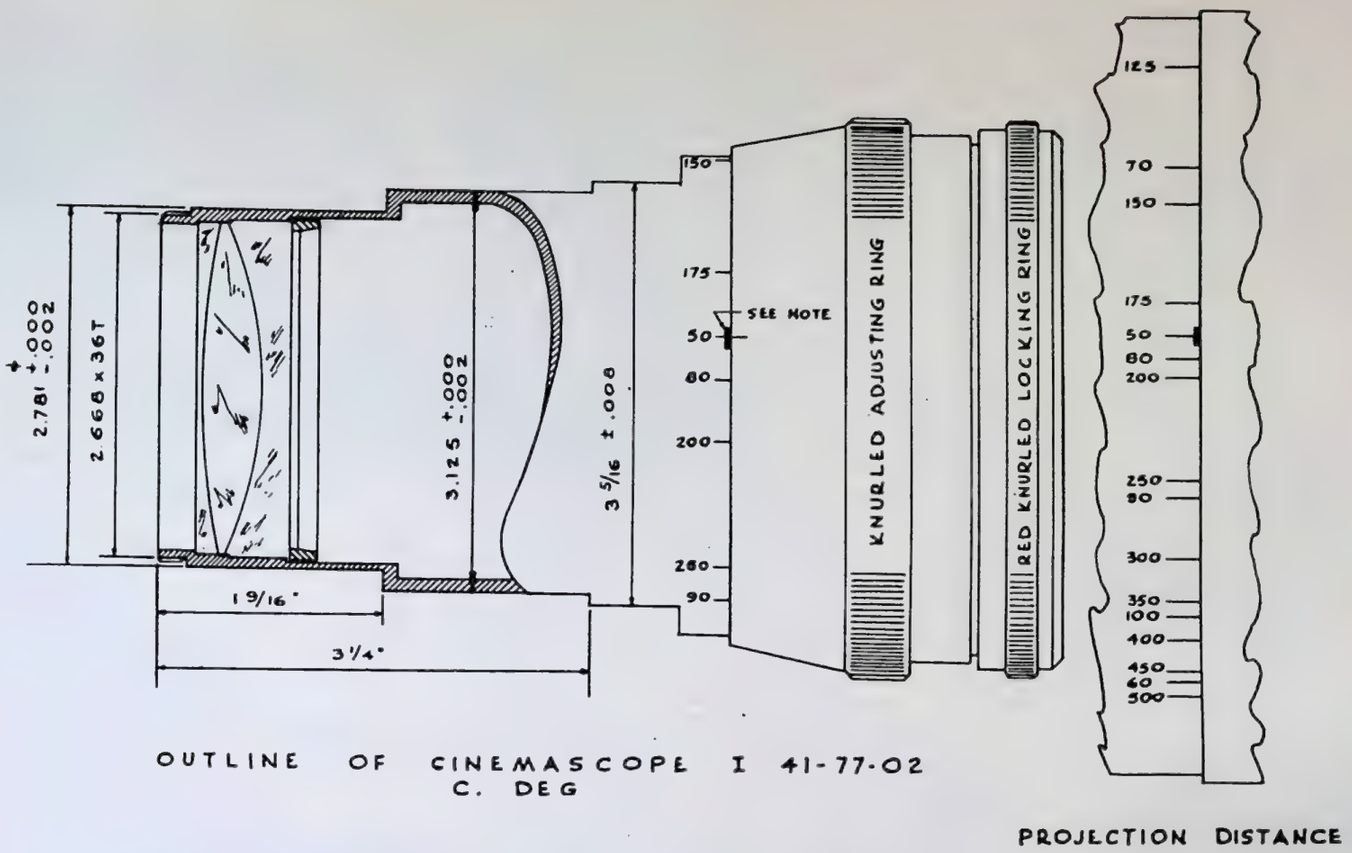


FIGURE 6 also provides data about the setting and unfolded scale for the lens attachment.

in the port to restrain the booth noises from the auditorium, a good grade of optical glass, preferably with anti-reflection coatings, should be installed. Too frequently poor glass has been used and loss of definition charged to other sources. With the greater magnifications being used in the various processes this factor is more important than ever.

SCREEN

The screens recommended for use with CinemaScope are of the controlled reflectance type, with metallic surfaces, which are the result of many years' development.

Miracle Mirror screens are made with a cotton base which is overlaid with several coatings of plastic surfaced with aluminum and accurately embossed with a fine detail pattern. The pattern is designed so that very little light is reflected to the average theatre auditorium where there are not seats but within the theatre seating regions the distribution is quite uniform. The uniform area of distribution includes 30 degrees above and below and 50 degrees to each side of a line perpendicular to the screen. It will be recognized that the typical theatre is adequately covered. By concentrating all of the incident light only to the regions of the audience, a screen is obtained which is at least twice as bright as the usual theatre screen for the same value of projector illumination. By virtue of the metallic surface the screen supplied for CinemaScope is excellent for 3-D polarized projection. The screen material is purposely made light in weight to facilitate hanging and to minimize the demands on screen frames and, because of this, it cannot be handled roughly; it is adequately strong if treated with reasonable care. The finely detailed surface can be damaged by severe rubbing or pressing and will be evidenced by dark spots which cannot be removed. No attempt should be made to clean or resurface the screen but it may be dusted with a soft dusting brush. The surface is such that it does not collect dust readily and does not discolor or oxidize easily. Experience has shown that the useful life of these screens is several times that of the ordinary white screen.

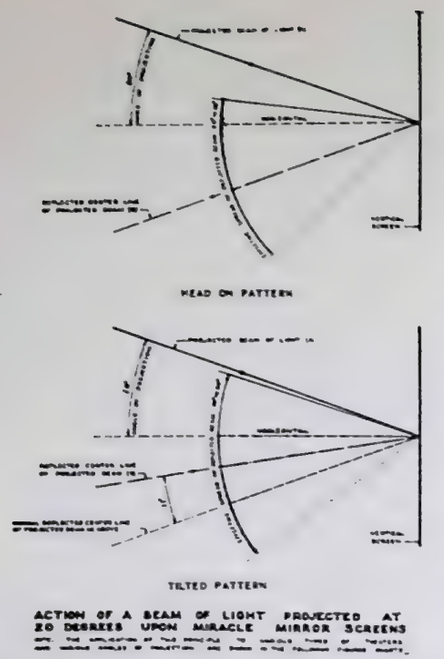
The screens should conform to the appropriate Federal specification applicable to the testing of such materials for fire resistance and flame proofing and although they will char and smolder when subjected to flame, combustion will not be supported.

Types

The Miracle Mirror screen is available in two patterns: one for head-on projection and a tilted design for high-angled projection. The result from the two patterns of the Miracle Mirror for 20 degrees projection is shown in Figure 7. It is obvious that the head-on pattern with high-angle projection would not reflect much light to a high balcony area, whereas the tilted design would serve admirably. The choice of pattern depends on the specific theatre conditions. A further choice resides in the possibility of tilting the top of the screen away from the projector a few degrees, up to five degrees or six degrees. In high angle projection this serves two purposes, first and primarily, to minimize picture keystone effect and, of secondary importance, to give more control of the vertical light distribution. A typical situation is shown in Figure 8.

A curved screen whose radius is approximately that of the projection throw has several real engineering advantages. When dealing with very wide pictures the angle at which the light beam strikes a flat screen at the sides is far from head-on and with restricted angles of reflection some of the side seats would not have adequate picture brightness; this is corrected with suitable curvature. Secondly, there is less overall picture distortion for side as well as for head-on viewing. Thirdly, picture definition at the sides may, under some circumstances, be improved. Curved screens do introduce one difficulty and that is the curvature of horizontal lines of the image. This difficulty can be reduced by the use of a slight tilt as described above. For short throws and steep projection angles, which produce severe curvature of horizontal lines, it may be better to compromise the curvature slightly and install a screen which is somewhat flatter than dictated by the projection distance. It should be recognized that when a curved screen is tilted the ends rise and due consideration must be given to sight lines, frame construction and masking.

Picture size, on a flat screen with head-on projection, for various projection throws and lenses with the CinemaScope aperture are shown in Table I. When a curved screen is used whose



ACTION OF A BEAM OF LIGHT PROJECTED AT 20 DEGREES UPON MIRACLE MIRROR SCREENS

FIGURE 7 shows the two available patterns of the Miracle Mirror for 20 degrees of projection.

radius equals the projection throw the screen size required for a given picture size may be obtained from Table II. The formula for computing the dimensions of the curved screen is also given in Table II.

Hanging

The screens are shipped as rolls and are carefully boxed, with the reflecting face of the screen protected by paper, inserted during the rolling.

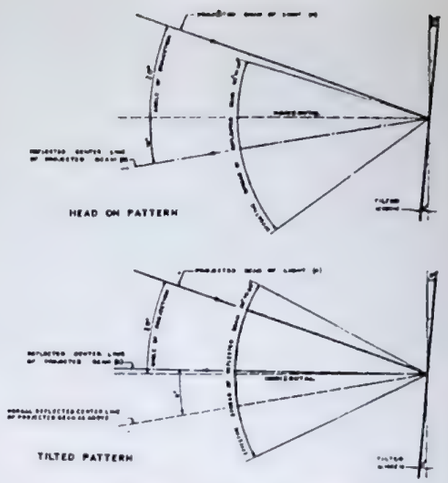
Screen sizes are given in over-all dimensions, including the webbing, in which latter the grommets are spaced evenly on six inch centers, with extra grommets at the ends of all seams.

All Miracle Mirror screens are plainly marked as to top and bottom, and this is particularly important in the case of the tilted pattern. In case of doubt, and in order to prevent errors, every panel is marked down the center with a row of tiny "V"s, which "V" has been placed on the embossing roll and repeats about every 20 inches. This "V" should appear point downward when the screen is properly installed.

In the earlier shipments the top of the screen was also indicated by a series of looped cords inserted at regular intervals in the top grommets. These served as temporary top supports while unrolling the screen, and also served to permit positioning the screen vertically. Since these temporary loops caused considerable trouble in rolling the finished screen, and made the top of the screen roll up more loosely than the bottom, thus permitting the layers to shift in shipment, *these temporary ties* have now been omitted, and loops of the proper length must be prepared, and inserted on the job, as the screen is being unrolled.

The screen will be rolled upon a metal tube to stiffen the package and must not be unrolled except to install it upon the frame. Accompanying the screen container will be a wooden plate somewhat larger than the diameter of the roll. In this wooden plate is a rectangular hold through which a peg (also included in the package) may be thrust and nailed securely in place. This peg will be furnished long enough to enter the tube on which the screen is rolled and yet leave a sufficient length below the plate to position the upper webbing of the screen at lacing distance from the upper member of the frame, when the entire roll, plate and peg have been assembled and lifted to a vertical position. The length below the plate may vary somewhat in every installation. If this peg is rounded at its lower extremity, the entire roll may be rotated freely upon the floor of the stage when upright, and the lower portions of the screen will be protected by the plate from crushing.

Before starting the installation of the screen, it should be determined how close the lower webbing of the screen is to be set to the floor and the lower member of the frame. A measurement should then be taken from that point to the hooks of the top member of the frame; subtract the height of the screen between grommets, and this dimension should then be used to make temporary loops for the top of the screen.



ACTION OF A BEAM OF LIGHT PROJECTED AT 20 DEGREES UPON MIRACLE MIRROR SCREENS

FIGURE 8 illustrates typical situation where top of screen is tilted away from projectors.

The operation of installing the screen is started by standing the roll upright, preferably in its box, adjacent to the frame and then carefully easing the screen out of its box on its peg. The prepared ties are inserted through the grommets and hooked to the top mem-

35-MM PROJECTION TABLE **CINEMASCOPE APERTURE: 0.912" x 0.715"**

Focal Length Inches	PROJECTION DISTANCE – FEET																
	40'	50'	60'	70'	80'	90'	100'	110'	120'	130'	140'	150'	160'	170'	180'	190'	200'
2.00	36.5 14.3	45.6 17.9	54.7 21.5	63.8 25.0	72.9 28.6	82.0 32.2	91.2 35.8										
2.25	32.4 12.7	40.5 15.9	48.6 19.1	56.7 22.2	64.8 25.4	72.9 28.6	81.0 31.8										
2.50	29.3 11.4	36.5 14.3	43.7 17.2	51.0 20.0	58.3 22.9	65.6 25.7	72.9 28.6	80.2 31.5									
2.75	26.5 10.4	33.1 13.0	39.8 15.6	46.4 18.2	53.0 20.8	59.6 23.4	66.3 26.0	72.9 28.6	79.6 31.2								
3.00	24.3 9.5	30.4 11.9	36.5 14.3	42.5 16.7	48.6 19.1	54.7 21.5	60.1 23.8	66.9 26.2	72.9 28.6	79.0 31.0							
3.25	22.4 8.8	28.1 11.0	33.7 13.2	39.3 15.4	44.9 17.6	50.5 19.8	56.1 22.0	61.7 24.2	67.3 26.4	72.9 28.6	78.5 30.8						
3.50	20.8 8.2	26.0 10.2	31.3 12.3	36.5 14.3	41.7 16.4	46.9 18.4	52.1 20.4	57.3 22.5	62.5 24.5	67.7 26.6	72.9 28.6	78.1 30.6					
3.75	19.4 7.6	24.3 9.5	29.2 11.4	34.0 13.4	38.9 15.3	43.7 17.2	48.6 19.1	53.5 21.0	58.4 22.9	63.2 24.8	68.1 26.7	72.9 28.6	77.8 30.5				
4.00		22.8 8.9	27.3 10.7	31.9 12.5	36.5 14.3	41.0 16.1	45.6 17.9	50.1 19.7	54.7 21.5	59.3 23.2	63.8 25.0	68.4 26.8	72.9 28.6	77.5 30.4			
4.25		21.4 8.4	25.7 10.1	30.0 11.8	34.3 13.5	38.6 15.2	42.9 16.8	47.2 18.5	51.5 20.2	55.8 21.9	60.0 23.6	64.4 25.2	68.6 26.9	72.9 28.6	77.2 30.3		
4.50		20.3 7.9	24.3 9.5	28.4 11.1	32.4 12.7	36.5 14.3	40.5 15.9	44.5 17.5	48.6 19.1	52.6 20.7	56.7 22.2	60.7 23.8	64.8 25.4	68.8 27.0	72.9 28.6	77.0 30.2	
4.75		19.2 7.5	23.0 9.0	26.9 10.5	30.7 12.0	34.5 13.6	38.4 15.1	42.2 16.6	46.1 18.1	49.9 19.6	53.7 21.1	57.6 22.6	61.4 24.1	65.3 25.6	69.1 27.1	72.9 28.6	76.8 30.1
5.00			21.9 8.6	25.5 10.0	29.2 11.4	32.8 12.9	36.5 14.3	40.1 15.7	43.8 17.2	47.4 18.6	51.0 20.0	54.7 21.5	58.3 22.9	62.0 24.3	65.6 25.7	69.2 27.2	72.9 28.6
5.25			20.8 8.2	24.3 9.5	27.8 10.9	31.2 12.3	34.7 13.6	38.2 15.0	41.7 16.3	45.2 17.7	48.6 19.1	52.1 20.4	55.6 21.8	59.0 23.2	62.5 24.5	66.0 25.9	69.4 27.2
5.50			19.9 7.8	23.2 9.1	26.5 10.4	29.8 11.7	33.1 13.0	36.5 14.3	39.8 15.6	43.1 16.9	46.4 18.2	49.7 19.5	53.0 20.8	56.3 22.1	59.6 23.4	63.0 24.7	66.3 26.0
5.75				22.2 8.7	25.4 10.0	28.5 11.2	31.7 12.4	34.9 13.7	38.0 14.9	41.2 16.2	44.4 17.4	47.6 18.7	50.7 19.9	53.9 21.1	57.1 22.4	60.2 23.6	63.4 24.9
6.00				21.3 8.3	24.3 9.5	27.3 10.7	30.4 11.9	33.4 13.1	36.5 14.3	39.5 15.5	42.6 16.7	45.6 17.9	48.6 19.1	51.7 20.3	54.7 21.5	57.7 22.6	60.8 23.8
6.25				20.4 8.0	23.4 9.2	26.1 10.3	29.2 11.4	32.1 12.6	35.0 13.7	37.9 14.9	40.9 16.0	43.8 17.2	46.7 18.3	49.6 19.5	52.5 20.6	55.4 21.7	58.4 22.9
6.50					22.4 8.8	25.2 9.9	28.1 11.0	30.9 12.1	33.7 13.2	36.5 14.3	39.3 15.4	42.1 16.5	44.9 17.6	47.7 18.7	50.5 19.8	53.3 20.9	56.1 22.0
6.75					21.6 8.5	24.3 9.5	27.0 10.6	29.7 11.7	32.4 12.7	35.1 13.8	37.8 14.8	40.5 15.9	43.2 17.0	45.9 18.0	48.6 19.1	51.3 20.1	54.0 21.2
7.00					20.8 8.2	23.4 9.2	26.0 10.2	28.7 11.2	31.3 12.3	33.9 13.3	36.5 14.3	39.1 15.3	41.7 16.4	44.3 17.4	46.9 18.4	49.5 19.4	52.1 20.4
7.50							24.3 9.5	26.8 10.5	29.2 11.4	31.6 12.4	34.0 13.4	36.5 14.3	38.9 15.3	41.3 16.2	43.7 17.2	46.2 18.1	48.6 19.1
8.00							22.8 8.9	25.1 9.8	27.3 10.7	29.6 11.6	31.9 12.5	34.2 13.4	36.5 14.3	38.7 15.2	41.0 16.1	43.3 17.0	45.6 17.9
8.50								23.6 9.3	25.7 10.1	27.9 10.9	30.0 11.8	32.2 12.6	34.3 13.5	36.5 14.3	38.6 15.2	40.7 16.0	42.9 16.8
9.00									24.3 9.5	26.3 10.3	28.4 11.1	30.4 11.9	32.4 12.7	34.4 13.5	36.5 14.3	38.5 15.1	40.5 15.9
	40'	50'	60'	70'	80'	90'	100'	110'	120'	130'	140'	150'	160'	170'	180'	190'	200'

SIZES GIVEN ARE TO THE NEAREST TENTH OF A FOOT

Table I

TABLE I shows picture size on a flat screen with the proper CinemaScope apertures given.

ber of the frame; the screen is unrolled by rotating it on the previously described plate and peg, and at the same time advancing the roll, plate and peg longitudinally in front of the frame. The screen must *not* be lifted out of the box by the ends of the metal tube—the tube could collapse and crush the screen.

Lacing of the top member may then be connected and if the grommet holes of the screen are all immediately below the hooks of the upper member of the frame, a loop type lacing may be used, but if the relationship of grommets and hooks is irregular, then a diagonal type of lacing should be employed. Usually the relationship will be correct as respects the top of the screen and frame. Once the screen has been unrolled and laced completely and evenly to the top member of the frame, the bottom webbing should be laced to the bottom member of the frame, starting at the middle of the screen and frame and lacing both ways. Before lacing the bottom member, the relationship of the grommets of the bottom webbing to the hooks of the bottom member of the frame should be studied and if the screen, falling evenly itself, locates the grommets and hooks in vertical lines then the loop type lacing may be employed, but if the relationship is irregular, a diagonal type lacing should be used.

If upon completion of this operation, the screen lays evenly and without folds in its final position, then the lacing on both screen ends should be completed either by loops or diagonals, in accordance with the relationship of the grommets and hooks at the sides. If upon completion of the above operation, the screen still lies evenly upon the frame, then the top and bottom lacings may be gradually firmed, using care not to exert too great tension at the individual grommets or in the overall.

When the top and bottom members have been snugly laced, then the end lacings may be completed, but only to the point of snugness, since a tight lacing at the ends will tend to raise the middle sections of the screen, thereby giving its face a vertical reverse curve.

It is usually desirable to snug all lacing progressively to the extent, if necessary, of going over them several times. The lacing cord stretches over a period of two to four weeks, and it may be found desirable to go over the lacings once or twice until the stretch has stopped and no wrinkles are apparent. It will be found that the seams become less apparent as the screen sets in final form.

If the screen should not lay evenly, after preliminary lacing upon a TILTED FRAME, the trouble will probably be found in the frame itself, which, in all probability, has not been tilted properly, and the ends of which do not rise naturally.

In that case it will probably be necessary to lace the screen unevenly as respects to the frame, that is, the central portions of the screen must be lowered and the outer portions raised, creating a smooth curved relationship between the top and bottom members of the frame and the screen itself.

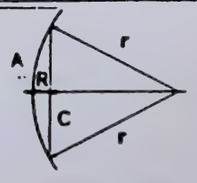
This relationship between screen and frame members must be adjusted until the screen falls evenly.

TABLE II offers information for use with a curved screen. The formula for computing the dimensions of the screen is also found here.

SCREEN WIDTHS (ARC OF PICTURE) AND RISES OF ARC (DEPTH OF CURVE) WHEN PICTURE WIDTH AND PROJECTION THROW ARE KNOWN.

PROJECTION THROW

CHORD OR PICTURE WIDTH	t	60		70		80		90		100		110		120		130		140		150		160		170		180		190		200	
	C	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R
	24	24.2	1.2	24.1	1.0	24.1	0.9	24.1	0.8	24.1	0.7	24.1	0.7	24.1	0.6																
	26	26.2	1.4	26.2	1.2	26.1	1.1	26.1	1.0	26.1	0.9	26.1	0.8	26.1	.7	26.1	0.6														
	28	28.3	1.6	28.2	1.3	28.1	1.2	28.1	1.1	28.1	1.0	28.1	0.9	28.1	.8	28.1	0.7	28.1	0.6												
	30	30.3	1.9	30.2	1.6	30.2	1.4	30.1	1.3	30.1	1.2	30.1	1.0	30.1	.9	30.1	0.8	30.1	0.8	30.1	0.7										
	32	32.4	2.2	32.3	1.9	32.2	1.6	32.2	1.5	32.1	1.3	32.1	1.2	32.1	1.1	32.1	1.0	32.1	0.9	32.1	.8	32.1	0.8								
	34	34.5	2.5	34.4	2.1	34.3	1.8	34.2	1.7	34.1	1.5	34.1	1.4	34.1	1.2	34.1	1.1	34.1	1.0	34.1	.9	34.1	0.9	34.1	0.8						
	36	36.6	2.8	36.4	2.3	36.3	2.0	36.3	1.9	36.2	1.7	36.2	1.5	36.1	1.4	36.1	1.3	36.1	1.2	36.1	1.1	36.1	1.0	36.1	1.0	36.1	0.9				
	38	38.7	3.1	38.5	2.6	38.4	2.3	38.3	2.1	38.2	1.9	38.2	1.7	38.2	1.5	38.1	1.4	38.1	1.3	38.1	1.2	38.1	1.1	38.1	1.0	38.1	0.9	38.1	0.9		
	40	40.8	3.4	40.6	2.9	40.4	2.5	40.4	2.3	40.3	2.1	40.2	1.9	40.2	1.7	40.2	1.6	40.1	1.5	40.1	1.4	40.1	1.3	40.1	1.2	40.1	1.1	40.1	1.0	40.1	1.0
	42	42.9	3.8	42.7	3.2	42.5	2.8	42.4	2.5	42.3	2.3	42.3	2.1	42.2	1.8	42.2	1.7	42.2	1.6	42.1	1.5	42.1	1.4	42.1	1.3	42.1	1.2	42.1	1.1	42.1	1.1
	44	45.1	4.2	44.8	3.5	44.6	3.1	44.5	2.8	44.4	2.5	44.3	2.3	44.2	2.0	44.2	1.9	44.2	1.7	44.2	1.6	44.1	1.5	44.1	1.4	44.1	1.3	44.1	1.2	44.1	1.2
	46	47.2	4.6	46.9	3.9	46.7	3.4	46.6	3.0	46.4	2.7	46.4	2.5	46.3	2.2	46.2	2.1	46.2	1.9	46.2	1.8	46.2	1.7	46.2	1.6	46.1	1.5	46.1	1.4	46.1	1.3
	48	49.4	5.0	49.1	4.3	48.8	3.7	48.7	3.3	48.5	3.0	48.4	2.7	48.3	2.4	48.3	2.2	48.2	2.0	48.2	1.9	48.2	1.8	48.2	1.7	48.2	1.6	48.1	1.5	48.1	1.4
	50	51.6	5.5	51.2	4.7	50.9	4.0	50.8	3.6	50.6	3.2	50.5	2.9	50.4	2.6	50.3	2.5	50.3	2.3	50.2	2.1	50.2	2.0	50.2	1.9	50.2	1.8	50.2	1.7	50.1	1.6
	52	53.8	5.9	53.4	5.1	53.0	4.3	52.9	4.0	52.7	3.5	52.5	3.2	52.4	2.9	52.4	2.7	52.3	2.5	52.3	2.3	52.2	2.1	52.2	2.0	52.2	1.9	52.2	1.8	52.2	1.7
	54			55.6	5.5	55.1	4.7	54.9	4.2	54.7	3.7	54.6	3.4	54.5	3.1	54.4	2.9	54.3	2.7	54.3	2.5	54.3	2.3	54.3	2.2	54.2	2.0	54.2	1.9	54.2	1.8
	56			57.7	5.9	57.2	5.1	57.0	4.5	56.8	4.0	56.6	3.6	56.5	3.3	56.5	3.1	56.4	2.9	56.3	2.7	56.3	2.5	56.3	2.3	56.3	2.2	56.2	2.1	56.2	2.0
	58			59.9	6.4	59.3	5.4	59.1	4.8	58.9	4.3	58.7	3.9	58.6	3.6	58.5	3.3	58.4	3.1	58.4	2.9	58.3	2.6	58.3	2.5	58.3	2.3	58.3	2.2	58.2	2.1
	60			62.1	6.9	61.5	5.8	61.3	5.1	61.0	4.6	60.8	4.2	60.6	3.8	60.6	3.6	60.5	3.3	60.4	3.0	60.4	2.8	60.3	2.7	60.3	2.5	60.3	2.4	60.2	2.3
	62			64.3	7.4	63.7	6.2	63.4	5.5	63.1	4.9	62.9	4.5	62.7	4.1	62.6	3.8	62.5	3.5	62.5	3.3	62.4	3.0	62.4	2.9	62.4	2.7	62.3	2.6	62.3	2.4
	64					65.8	6.7	65.5	5.8	65.2	5.2	65.0	4.8	64.8	4.4	64.7	4.1	64.6	3.8	64.5	3.5	64.4	3.2	64.4	3.1	64.4	2.9	64.3	2.8	64.3	2.6
	66					68.0	7.1	67.7	6.3	67.4	5.5	67.1	5.1	66.9	4.6	66.8	4.3	66.7	4.0	66.6	3.7	66.5	3.5	66.4	3.3	66.4	3.1	66.3	2.9	66.3	2.7
	68					70.2	7.6	69.8	6.7	69.5	5.9	69.2	5.4	68.9	4.9	68.8	4.6	68.7	4.3	68.6	4.0	68.5	3.7	68.5	3.5	68.4	3.3	68.4	3.1	68.3	2.9
	70					72.4	8.0	72.0	7.1	71.6	6.3	71.3	5.7	71.0	5.2	70.9	4.9	70.8	4.6	70.7	4.2	70.6	3.9	70.5	3.7	70.5	3.5	70.4	3.4	70.4	3.1
	72							74.2	7.5	73.7	6.7	73.4	6.0	73.1	5.5	73.0	5.2	72.9	4.8	72.7	4.5	72.6	4.1	72.6	3.9	72.5	3.7	72.4	3.5	72.4	3.3
	74							76.5	8.0	75.9	7.1	75.5	6.4	75.3	5.9	75.3	5.5	74.9	5.0	74.8	4.7	74.7	4.4	74.7	4.1	74.6	3.9	74.5	3.7	74.4	3.4

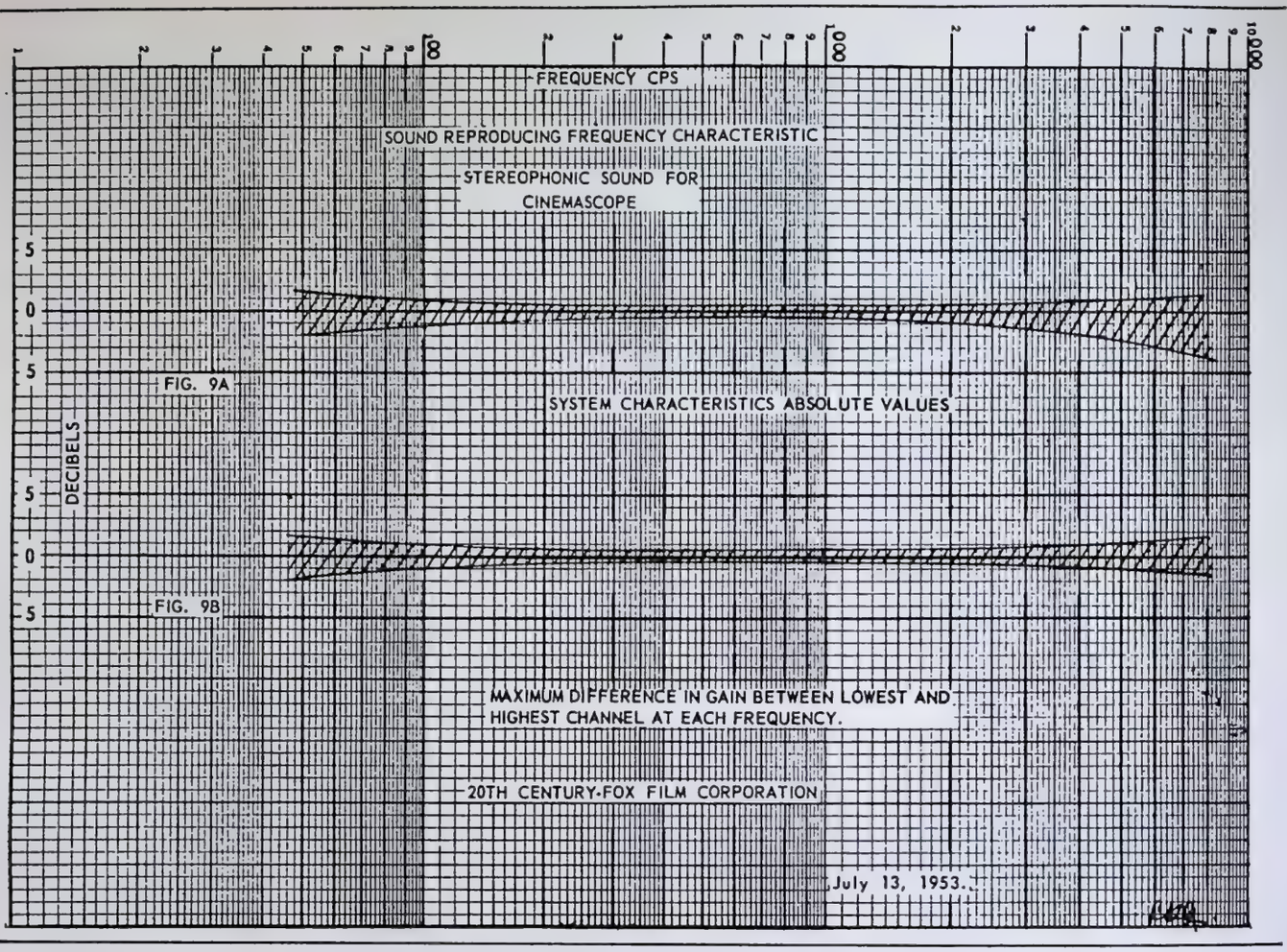


C = CHORD
r = RADIUS
A = ARC LENGTH
R = RISE

$R = r - \frac{1}{2}\sqrt{4r^2 - c^2}$ (EXACT) $\quad R = \frac{c^2}{8r}$ (APPROX)

NOTICE: These figures may be used for screen or frame; the inside dimension of the frame being a minimum 12 inches greater than the screen.

Table II



The final step in lacing is to install additional ties through the grommets at each end of all seams, tightening them sufficiently to remove seam wrinkles. (This is extremely important as it is the only way the puckers formed in sewing may be removed.)

Detailed instructions are packed with each screen, and may be changed from time to time as experience may dictate; the procedure outlined here will, however, produce a smooth, perfectly hung screen. Do *not* use *springs, rubber bands,* or any *heavier lacing cord* than that supplied. The grommets are carefully installed, and as the tension is increased on the cord, the vinyl binding will first deform, then the grommet should pull out, before the screen material tears, or the sewing fails. This is done deliberately—it is better for a grommet to pull out than to ruin a screen. When the vinyl binding shows marked deformation around the grommet, the cords are tight enough.

It is absolutely impossible to hang a screen smoothly on a light, flimsy frame that bends faster than the cords can be tightened. If seam wrinkles persist and the frame is of light construction, check the members for bending. Instructions similar to the above will be packed with the Astrolite screen.

SOUND

Magnetic sound tracks are recommended with CinemaScope principally because of the simplicity of the reproducing equipment and for the better technical performance which is required due to the use of somewhat narrower tracks and the demands of stereophonic sound. Stereophonic recording requires that at least three tracks be used and extreme difficulty would be experienced in maintenance of the theatre sound equipment if optical systems, exciter lamps and photocells were to be kept within narrow performance limits relative to each other. Magnetic sound, of course, has its own peculiar problems in the field and some of these will be discussed in the following material. In general it can be said that with reasonable care and under the customary circumstances in projection booths, the use of magnetic tracks need cause no alarm. Although tests of magnetic film have been made to determine its susceptibility to erasure or the introduction of noise by deliberate exposure to the usual electrical apparatus such as transformers, motors, generators and rectifiers and no serious effects have been found, it is wise to avoid subjecting the magnetic tracks to strong electric fields. If the handling is confined to the usual rewinds, carrying cases and projection apparatus, it is not expected that magnetic film will suffer any more from field use than optical tracks do in their particular way. Obviously, by deliberate intent, magnetic tracks could be ruined but for this matter, so can optical tracks.

Most CinemaScope single film releases will provide three principal tracks for the stereophonic sound and a fourth track of somewhat lesser but adequate technical performance for effects which are to be supplied to the auditorium, or surround, loudspeakers. The magnetic tracks are also depicted in Figure 3.

Loudspeaker Systems—Screen

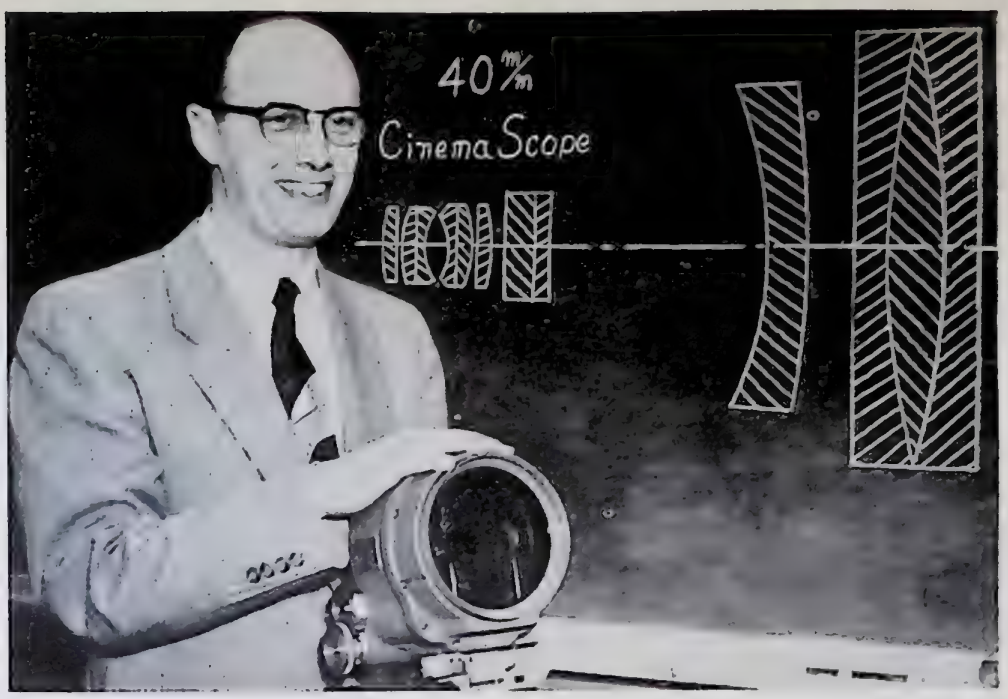
The three loudspeakers should be identical types and of approximately the same sensitivity. The reason for this is obvious if the reader will consider that the voice quality of an actor should not change unnaturally as he moves across the screen. In order that the studio Sound Department may record the dialogue or sounds in their proper space relation within the picture frame, it is important that the loudspeaker locations within the screen frame be known. This fact demands standardiaztion of speaker locations and for CinemaScope release we have adopted the standard that the center-to-center distances between loudspeakers shall be equal to one-third of the screen width. Another way of stating the same specification is that with the CinemaScope aspect ratio of 2.55 to 1, the center-to-center distances between loudspeakers shall be 0.85 times the picture height. In cases where there is a serious physical limitation, this specification can be modified by 10 per cent but preferably to the wide spacing rather than a narrow spacing. The cen-

ter line of the high frequency unit should be located between one-half and two-thirds of the picture height. In some cases, in order to obtain proper spacing, it has been expedient to leave off the outer wings, or baffles, of some of the current models of loudspeakers. Also, if it is necessary to have the low frequency sections a little closer than the specification, the high frequency units can usually be moved outward from the center line of the low frequency units. In the use of these expedients good judgment must prevail since, obviously, it is possible to overdo these compromises. Generally speaking, loudspeaker installations for certain recent releases have placed the speakers further apart than specified above and if this difference does not exceed 10 per cent between the ideal and the actual conditions, then no relocation of the speakers need be made for exhibiting the various products. The reader may wonder how sounds can be made to localize at or beyond the edge of the screen when there is no loudspeaker located in these regions but with true stereophonic sound this is readily done. Loudspeakers kept within the boundaries of the screen permit the recording engineer to provide close-up quality of sound whenever required. Offstage sounds are achieved by the natural perspective effects and the manner in which the relative loudnesses of the channels vary as the sound source moves laterally away from the picture scene.

For good performance of the high frequency unit, the horn mouth should be as close to the screen as possible and since there is a definite relationship between the high frequency and low frequency units for correct phasing at the crossover frequency, this usually demands that the low frequency unit also be placed close to the screen. Hence, with curved screens as recommended for CinemaScope, the low frequency units will usually be pointing slightly toward the center of the audience. Ideally, the high frequence units should be twisted around to point directly out rather than be "toed in," and insofar as it is possible, covering the seats at the far side front and one the near side, but favoring the latter if a compromise must be made.

The customary check for speaker unit phasing should be performed.

After the initial adjustment according to the specifications, the sound distribution from each of the loudspeakers should be checked throughout the house and, if necessary, the high frequency unit twisted or tilted to obtain a suitable distribution. The final test on the loudspeaker placement consists of reproducing material from each of the loudspeakers in turn and checking throughout the house to see that the sound directivity is not affected by some peculiar acoustic situation. A circumstance which must be avoided is sometimes caused by peculiar acoustics whereby reflected sound occurs from the opposite wall, the result being, insofar as the audience is concerned, as though the sound originated from the opposite side of the screen than that which was intended. In general, it is better to use high frequency horns whose distribution just fits the house rather than have excessive spread. If the loudspeakers must be occasionally moved, the proper locations should be marked or some other provision made so that they can be readily returned to the desired placement.



SHOWN against a blackboard diagram of a new 40mm CinemaScope lens is John D. Hayes of the Bausch & Lomb Company. He holds the first of the new lenses recently shipped to 20th-Fox. The 40mm lens is the first of a complete range of focal length up to 152mm. now under development.

Loudspeaker Systems—Surround (Auditorium)

When loudspeakers are installed upon the walls of a theatre to reproduce effects which are intended to surround, or encompass, the audience, great care must be exercised to assure that uniform distribution of signal is obtained, that no large part of the audience hears the effects from a definite source unless such intent is deliberate in the production, and that loudspeaker units are selected which will reproduce the effects with some reasonable fidelity.

Generally, and particularly in theatres with mezzanines or balconies, the surround loudspeakers must be placed close to the audience seated at the sides, and, because of this closeness, reproduce the audio signals as discrete sources rather than as a surround. This can only be corrected by using sufficient numbers of loudspeakers each having proportionately low input but having a total sound output power sufficient to fill the auditorium. This philosophy does not forbid the use of any particular group of side, or rear, speakers for extreme directional effects; each kind of effect merely determines the circuit design and amplifier requirements. It is suggested that the left side, right side and rear speakers be wired as separate groups, and each group brought to the amplifier rack as separate circuits. With this circuit arrangement all speakers can be driven simultaneously or changes readily made to drive them as independent groups with their own amplifiers. The events of the future will finally dictate the best arrangement and wiring as suggested herein will provide flexibility. With CinemaScope, as now foreseen, the single effects signal will be fed to all the surround speakers simultaneously. It is quite feasible to uitilize certain control signals in the future to switch the effects to any particular group of surround speakers.

The reproduction of effects requires a good frequency response and surround speakers should be chosen which reproduce all significant frequencies reasonably well. Many excellent effects contain considerable amounts of low frequencies and if these are not reproduced the whole reason for the effect is lost. In many instances, loudspeakers have been selected for the surround which have too little low frequency response.

Amplifier System

The amplifiers used in each channel should be identical units and each power amplifier should have a power capacity equal to that demanded by the theatre from a single system such as now being used. This means of course that the total power available in the theatre will be three times, or 5 db, greater for stereophonic than for single channel. Since the trend is toward greater power in the theatre to enhance the reproduction of spectacular effects, this added power is gained automatically by the installation of stereophonic sound equipment. The reader may wonder why the power capacity of the individual channels should be capable of filling the house but will recognize that this is true if he will consider that there are times when effects are principally reproduced by only one of the three channels.

Signal and Control for Surround Effects

Track No. 4 (Effects and/or Control) of the CinemaScope composite release film is intended to furnish the signals for the surround effects. Whenever the theatre is showing a picture which provides surround effects, the track and

system noise will exist in the auditorium at all times with or without signal, unless this noise is somehow suppressed between periods when there is signal. Therefore, a simple control device is being used for the initial CinemaScope releases. This control is operated by superposing a 12 kilocycle frequency on the effects tracks when recorded signal exists, i.e., there is 12 kc present only when the effects are to be reproduced and none at other times. Preceding the power amplifier there are simple separation circuits, control amplifiers and an audio amplifier or relay. All of these units are called "switchers," "control amplifiers" or "suppressor amplifiers."

The separation circuits route the audio signal to the amplifiers and the 12 kc control signal to sharply tuned circuits. In some apparatus there are two such tuned circuits which might require adjustment in the theatre because of speed differences in the machines. The two tuned circuits should be stagger-tuned slightly, i.e., one tuned about 100 cycles below and the other 100 cycles above the optimum output tuning point. With proper adjustment slight speed variations will not cause erratic operation. Some equipments use only a single tuned circuit and this must be adjusted for optimum performance of the control signal. Also, there are units which have a tuned circuit in the audio branch which is intended to remove the 12 kc signal from the audio circuit and this circuit should be adjusted so that it cuts off very sharply between 7 and 11 kc in order to remove substantially all the 12 kc from the surround speakers.

When a control or suppressor amplifier is used the 12 kc signal derived from the separation circuits is amplified and rectified. The rectifier output is used, sometimes in conjunction with another tube, to vary the net grid bias on the audio amplifier section; this operates to change the gain of the amplifier. The circuits are specified to operate with a minimum 12 kc input voltage of .025 volts; an increase in the 12 kc input does not appreciably increase the gain. As a safety factory the 12 kc control is being recorded to produce .05 volts input. When 12 kc is not present on the track the audio amplifier gain is low and the noise is suppressed. In those equipments using a relay instead of an amplifier the presence of 12 kc operates the relay to close the audio circuit and when no 12 kc exists the relay opens the circuit. Thus, in either case, the control operates as a simple on-off scheme.

It is obvious that the amplifiers preceding the switcher must pass sufficient 12 kc to provide satisfactory operation of the particular model used.

The gain of the effects channel should be adjusted to produce a surround level compatible with the screen horn levels so that the audience feels, or senses the sound from all directions.

Undoubtedly, additional control features and signals will be developed as the need arises. The system described appears to be the simplest and most economical scheme to meet the initial demand.

Noise

More attention must be paid to minimizing system noise since the noise signal from all three channels (film and amplifiers) is constant and adds, while the signal output from the three channels is seldom at maximum level simultaneously. Hence, the overall signal-to-noise ratio is sometimes less than that of a single system installation.

Response

The electrical frequency characteristic of each channel will eventually be standardized but for the time being it will be satisfactory to state that the overall characteristic from recording through reproduction shall be flat from 50 to 8000 cycles with tolerances as shown in Figure 9A.

The relative response of the channels is more important than absolute or average response. The tolerances or permissible variations between channels is shown as Figure 9B. This measurement must be made with a suitable test film because the recording characteristic will have pre-equalization of approximately 6 db at 60 cycles and 3 db at 8000 cycles, both of which are useful to reduce hum and noise difficulties. The amplifier system, if measured independently, will have a frequency characteristic with a slope of 6 db per octave (6 db decrease in signal for each doubling of frequency) except as this characteristic may be modified to take into account the low frequency pre-equalization and high frequency losses.

The mid-band channel gains must be adjusted to within 1 db between the lowest and highest channel.

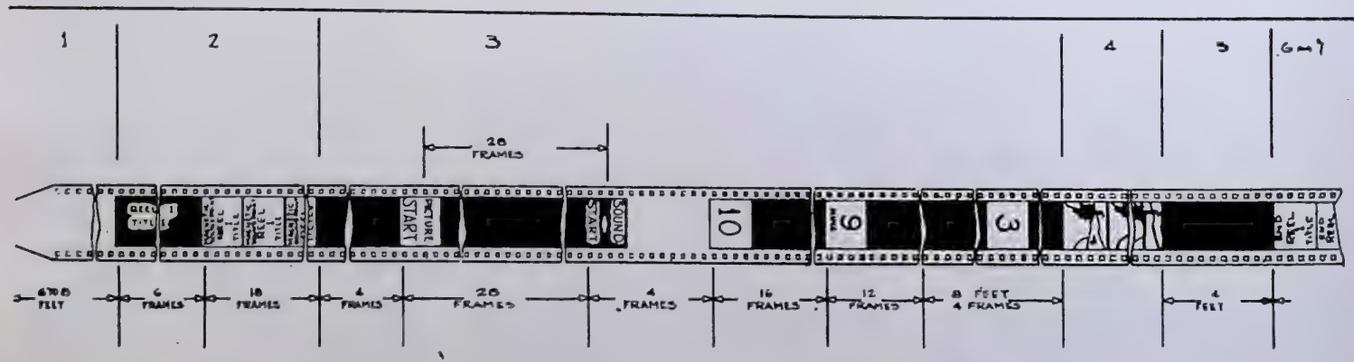
Intimate contact between the magnetic track and the pickup head surface is very important for high frequency reproduction, and any factor, such as distorted film, low film tension or any accumulation of dirt or oxide on the head surface—all of which tend to destroy good contact—must be observed and minimized. Clean the surface with a soft rag or wooden stick. Azimuth should be adjusted for maximum output.

Subjective Tests

Since there is no simple way to determine the efficiency of loudspeaker systems, a final check of the relative channel reproduction should be made by listening tests, comparing the output of each channel independently from a known test film having equal and identical signals on all three tracks. By this subjective test, the channel gains can then be adjusted to have equal output. An excellent method is to use warbled single frequencies, one below the loudspeaker crossover network frequency and one above. For example, 400 cps and 800 cps would be suitable.

Phasing

The overall phasing should be checked by making a common connection between one wire of each loudspeaker at the input to the dividing network and



SECTION 1 – SAME AS ASA Z22.55–1947.
2 – " " " " "
3 – FOUR OPAQUE FRAMES PRECEDING PICTURE START.
SOUND START MOVED TO 28 FRAMES FOLLOWING PICTURE START WITH OPAQUE FRAMES BETWEEN.
FOOTAGE MARK ELEVEN (11) ELIMINATED.
THREE CLEAR FRAMES FOLLOWING SOUND START.
PICTURE FRAME LINES IN OPAQUE FRAMES BETWEEN FOOTAGE MARKS.
CLEAR DIAMOND 1/8"±2/8" 28 FRAMES FOLLOWING EACH FOOTAGE FRAME EXCEPT WHEN THESE FALL IN THE SECTION FOLLOWING THE THREE FOOT (3) FRAME.
NUMERALS 6 AND 9 TO HAVE WORDS "SIX" AND "NINE" BELOW NUMERAL AND IN SAME FRAME.
4 – SAME AS ASA Z22.55–1947
5 – INCREASED TO FOUR (4) FEET.
6 – SAME AS ASA Z22.55–1947.
7 – " " " " "

NOTES: 1 – FIRST SIX FRAMES OF SECTION 2 SHOULD BE CLEAR LETTERS IN OPAQUE BACKGROUND.
2 – PICTURE APERTURE IN LEADER SHALL BE CINEMASCOPE SIZE (.912±.715)
3 – SOUND START LETTERS SHOULD BE CLEAR ON OPAQUE BACKGROUND

SPECIFICATION FOR CINEMASCOPE - 35MM RELEASE PRINTS IN STANDARD 2000-FOOT LENGTHS. (PROPOSED)

with equal and like signals from all three tracks measure voltage between the remaining wire of networks 1 and 2 and networks 1 and 3. The phasing is correct if the voltage read is zero, or very small, compared to the signal voltage at any network input.

OPERATION AND FILM HANDLING

All of the manufacturers of sound heads for CinemaScope will supply units, for magnetic reproduction, which will be mechanically placed between the upper magazine and the top of the picture head casting. This means that, with a composite film, sound will lag the picture rather than lead as is now the case. In order to accommodate the variety of projectors, a sound-picture displacement of 28 frames has been standardized.

The 28 frame displacement is correct when the intermittent pull-down is half way between the end of frame pull and the beginning of the pull for the next frame. No allowance has been made in the amount of offset to take into account the time of sound travel to the average audience location in the theatre, it being considered better practice for the projectionist to thread the film in such manner as to correct, if necessary, for the specific house. Each frame represents about 46 feet. For the sound to arrive at the screen speakers ahead of picture, the film length between picture gate and magnetic pickup head must be shortened. This correction can be made at the time of head installation when the film path must be adjusted for the particular projection machine model.

A new leader (Figure 11) has been devised with the correct locations of the picture start-mark and a corresponding sound synchronization mark. Inspection of this leader will disclose that the sound is in fact 28 frames behind the picture, and for CinemaScope release, the projector and sound-head should be carefully threaded so that the picture start mark is framed in the aperture, the sound start is lined up with the centers of the magnetic pick-up heads and suitable loops provided. The identification frames indicate that the sound is magnetic and therefore must be threaded through the magnetic head. The only other changes in this leader as compared to the present standard leader are that the 11 foot mark has been eliminated although the 12 feet for projector start is still maintained; and there is one additional foot provided at the tail for run-out. Clear diamonds are provided 28 frames following each footage mark, so that the film can be threaded in the projector for quicker start times than the usual 12 feet. These latter synchronizing marks are not labelled and, if the projectionist finds he must use them, and although there is little chance for error, he must be sure to use the corresponding picture and sound indications so as to maintain synchronism on the screen.

As indicated above, any presently produced product can be run on a projector which has been correctly modified for CinemaScope release; and when optical sound release pictures are being exhibited, the film can be threaded through the magnetic head so as to by-pass the mechanical filter and magnetic pick-up heads. Each manufacturer will provide suitable rollers to achieve by-pass but undoubtedly each will do it in a different way and the projectionist must determine at the time of installation the recommended threading process for the specific unit installed in his house.

When the machine is threaded for magnetic tracks the photographic sound head can be by-passed by threading directly to the sprockets with sufficient loops taking care that the film does not scrape anywhere. The exact threading used to by-pass the scanning point will vary with each kind of sound head.

CinemaScope film can be spliced but the splicers must be modified to have register pins suitable for the film. Film splicer manufacturers have been informed of the required changes and will have available new equipment or modification parts for this purpose.

Two precautions must be observed when making a splice. First, both ends of the splice must be scraped because of the magnetic tracks which are applied to the base side of the film.

The second precaution is that an excess of film cement should not be used in making the splice since some of the tracks dissolve very readily in existing film cements; with excessive use of cement, the tracks will bleed or dissolve at and around the joint. With the careful application of cement, a good mechanical splice can be made without damage to the magnetic tracks.

Thirdly, the scraping should be such as to provide as little possible open space between the ends of the magnetic tracks which are joined. Spaces between tracks are points of no signal and usually make very little noise. However, if the space is unduly large, the splices will be audible. If it is found that the splices have a clearly audible low frequency thump or "pop," it is probably due to parts of the splicer having become magnetized and the operation of making the splice induces a low frequency signal in the magnetic track. The solution to this problem is to demagnetize, or degauss, the critical parts of the splicer or obtain parts which are made of suitable non-magnetic materials.

Little attention has been paid, in the past, to proper adjustment of the takeup. This is a bad condition and must be minimized but it must be made clear that the requirements of CinemaScope are not unique in this regard. The condition has been particularly aggravated by some recent installations for 3-D using fast starting types of motors, and removal of flywheels. The takeup should be adjusted to provide just adequate tension at the end of the 2000 foot reel so as to keep the tension at the start of the reel within the sensible limits. Proper attention to maintain smoothness of operation is also helpful or the exhibitor may elect to purchase some of the newer and better takeup equipments.

There are many items of theatre equipment maintenance and film handling practice which can cause severe film damage and too often these have been given little attention. The film producer and distributor can do only so much in this regard and the remainder is up to the theatre personnel.

CONCLUSION

An attempt was made in composing this material to include as much detail as seemed necessary, but without burdening the reader excessively. Emphasis has been placed most on new items and others, about which general knowledge exists, have been treated more generally. The engineering advice of 20th Century-Fox Film Corporation is available to all exhibitors, suppliers, equipment and service companies. This Company is anxious to cooperate on any problem pertaining to the exhibition of CinemaScope which will further the best possible presentation in the theatre. The Company's prime interest in CinemaScope is to be of benefit to the industry, the exhibitor, the producer and the equipment supplier.

THIS STILL from the 20th-Fox production, "Untamed," illustrates the tremendous amount of action that can be encompassed in a single long shot. This is one of the many virtues of CinemaScope process.



The Paramount VistaVision Process

A Detailed Study of the Theatrical and Studio Applications of this Wide Screen Process with the Double-Frame Negative

BRIEF: *This article offers a thorough summary of the VistaVision process . . . There is detailed information on the studio uses and applications of this process . . . dealing with such things as handling of the double-frame negative . . . the lenses which may be used on the cameras . . . lighting requirements . . . sound recording procedures . . . etc.*

The second half of this article deals with the theatrical uses of the wide screen system . . . and covers many subjects which should be of great interest and value to exhibitors . . . and other interested parties . . . Such topics as booth procedure . . . stereophonic sound . . . aspect ratios . . . screen sizes . . . drive-in applications . . . and projector lenses are among the many subjects covered by the Paramount Research staff . . . headed by Loren L. Ryder . . . who prepared the material used in this article.

Although it is likely that not everyone will agree with all that is said in this piece . . . it is important that all views be given the spotlight . . . so that the facts and arguments for each of the various new techniques may be heard . . . and allow the individual to make up his own mind about the merits of each.

Prepared By
PARAMOUNT STUDIOS RESEARCH STAFF

Definition

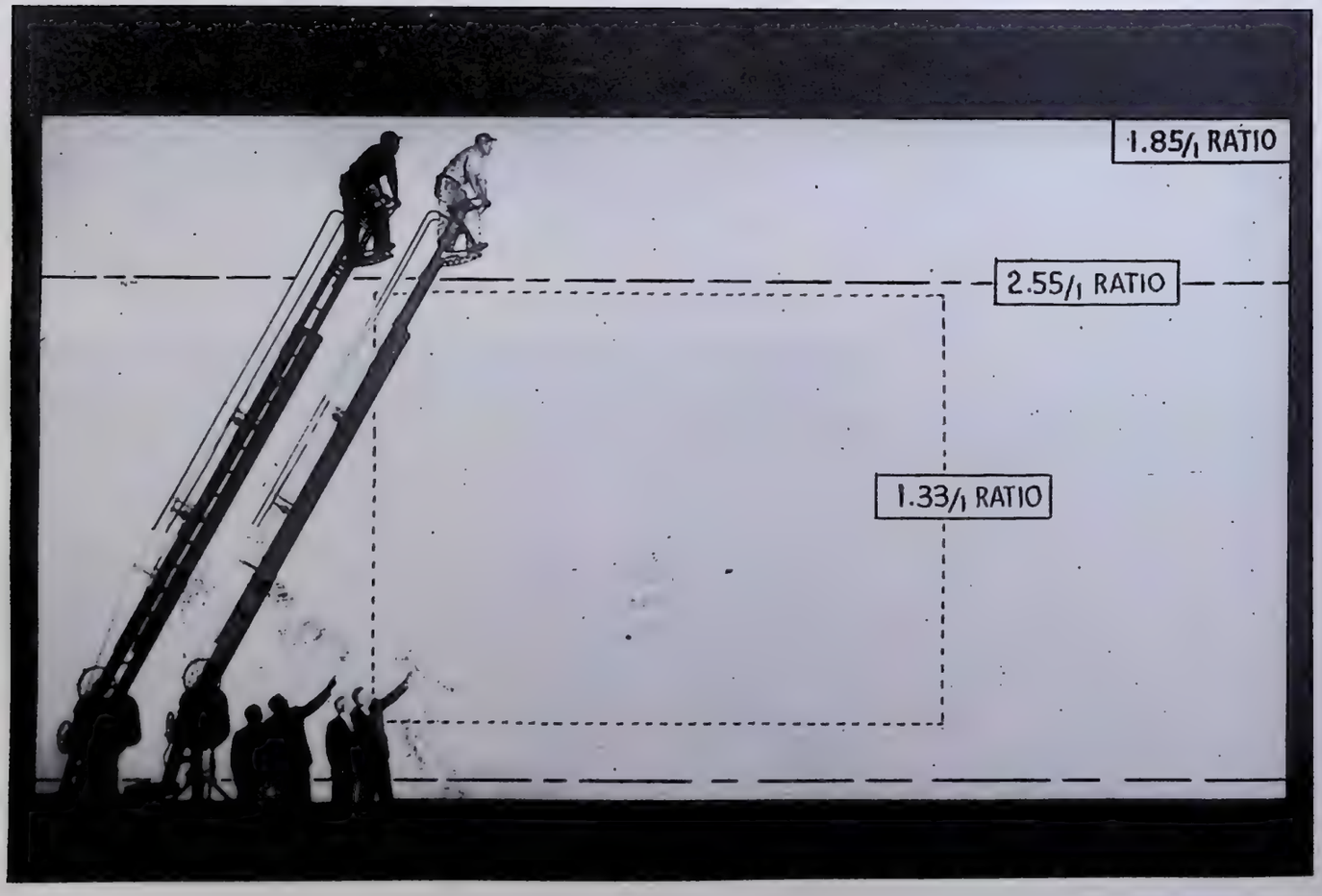
Briefly, the VistaVision process includes new wider angle lenses to give greater scope on the big screens; new cameras through which the 35mm negative travels horizontally eight sprocket holes per frame, (instead of four) giving a negative image with an area of nearly three times the area of the standard negative image. The picture negative is Eastman Mazda color taking stock. It is processed by Technicolor and optically reduced directly from the negative to the Technicolor matrix, which in turn is used to stamp out the release print by the imbibition process. All release prints will have a single photographic sound track that will play on every standard sound reproducer the world over. Paramount does not contemplate the release of any pictures with either a separate or four-track magnetic film.

Production Technique

The technique of picture shooting with the VistaVision camera is the same as with any standard camera.

The light level used on interior sets is between 350 and 600 foot-candles; with most shots running between 400 and 500 foot-candles. This is the same light level that has been in use at Paramount studios for over a year. The lenses are stopped to f:2.8 and f:3.2.

With respect to camera lenses, Paramount has found that standard motion picture lenses of 74mm and up, have adequate field coverage for use on the double-frame camera. High quality Leica type lenses are used for the shorter focal lengths. This includes lenses down to 24mm, which will give a photographic angle of coverage slightly above 75 degrees. Improved lenses are being designed which will include lenses of still shorter focal length. It is the writer's opinion, however, that we are gaining an adequate angle of coverage.



DOTTED line shows comparison of VistaVision aspect ratio with old standard. Broken line is a comparison with the CinemaScope 2.55:1 ratio.

FIGURE 1 illustrates the size of the negative in the VistaVision process. If a circle were photographed it would appear as illustrated.

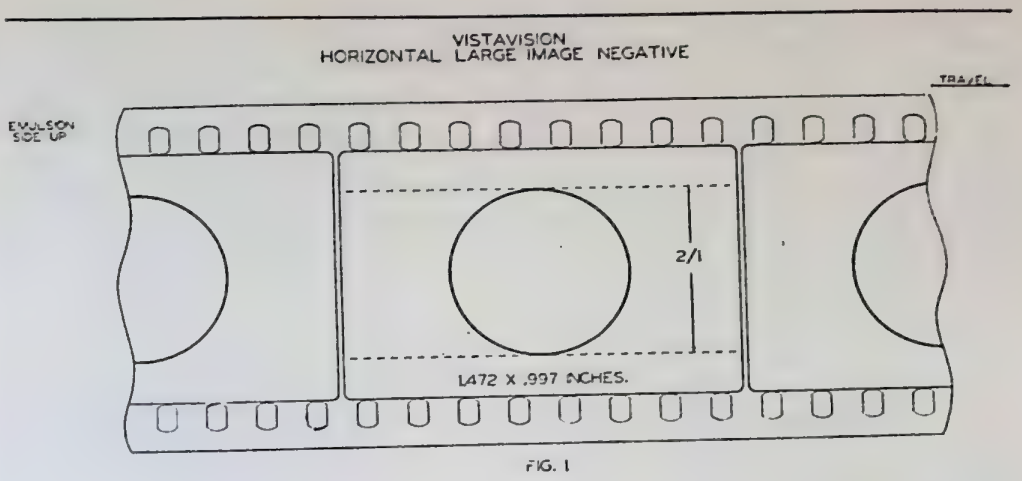


FIG. 1

The most important feature of VistaVision is the large negative, and its optical reduction to the standard print. In VistaVision this can either be accomplished by using a special wide film negative with the subsequent photographic reduction, or the horizontal eight-sprocket hole film movement as herein explained. Tests indicate that as we increase the size of the negative, we improve picture resolution in the plane of focus and grain size reduction, but beyond a certain point we tend to lose depth of field. We believe that in our use of the VistaVision process we have selected the best ratio of negative area to positive area for motion picture making. We have established the negative width for optimum results, taking into account the image reduction factor and wide angle photography. At this width we have gained slightly in depth of field. The VistaVision system has a large gain in depth of field if the image height is maintained the same as on standard photography.

The finders on the VistaVision cameras carry a hairline marking in the aspect ratio of 1.66:1. There will also be a frame line marking for the 1.33:1 aspect ratio. The cameramen are instructed to compose for a loose (meaning adequate head-room) 1.66:1 picture. A picture composed in this way will play equally well at 1.85:1; it will play very satisfactorily at 2:1, and it can be played at the old standard 1.33:1.

The VistaVision cameras will be used for all future Paramount black and white pictures, as well as color pictures. It is contemplated that the same benefit will be derived on black and white that is now being gained in color photography.

The production picture dailies are optically printed directly from the large color negative to the standard 35mm image size. The reduction ratio is 1.63:1. Eastman color stock is now being used for all daily prints. The editorial and studio handling of these prints is exactly the same as the previous handling of daily, except that special negative numbers are placed on both print and negative for future negative cutting. The special numbering may be eliminated when there is enough time to modify a printer so as to print-through the negative numbers.

Sound Recording

In our work with stereophonic sound we have found that it is overbearing and gives too much effect of movement for front seat listening, and it is of little value in the rear of theatre. Further, classical sterophonic sound tends to punctuate cuts, and detracts from the smooth flow of the pictured story.

Paramount suggests Perspecta Stereophonic Sound for the very large theatres, and for use by exhibitors who feel that they should have a stereophonic or directional effect.

As indicated before, all VistaVision release prints will have standard photographic sound tracks, which will play on any existing standard optical sound heads. These same sound tracks will also carry low frequency modulation at three different frequencies which will control the volume of the center and side loudspeakers, in those theatres that are equipped with Perspecta stereophonic sound control units.

These sound control units will cost abuot $800 plus about $500 for installation. In theatres that do not have auxiliary loudspeakers, it will, of course, be necessary to purchase extra loudspeakers and amplifiers. All houses that have been equipped for stereophonic reproduction can use directional sound by merely purchasing the integrator sound control unit.

The production shooting for VistaVision sound will be handled the same as on any monaural sound picture. At Paramount all production recording is done on 17½mm film in the 65 pound suitcase recorders built by Paramount. All scoring will be single sound track magnetic with as much reverberant bigness as can be obtained. On future pictures, it is contemplated that all sound editing will be with striped magnetic 35mm film, and the magnetic cutting print will be used as the rerecording print.

All rerecording will be to a single-sound track magnetic master which will have rerecorded (dubbed) with monaural monitoring. The single-track magnetic composite film will then be made stereophonic in the rerecording channel, using three horn systems and the necessary panning pots to gain any desired balance. A magnetic control track will be made during each review, and when a satisfactory review is obtained the control track will be combined with the rerecording master in the preparation of a photographic negative for release printing.

With respect to the foreign handling of sound for dubbed versions, we will keep the music, sound effects, and dialogue on multi-track magnetic for shipment to the foreign studios for dubbing. The stereophonic effect for the foreign Perspecta Sound release will be effected at the time of foreign dubbing.

Release Printing and Distribution

All domestic, and possibly the foreign release prints, are to be made by a new imbibition dye transfer method which Technicolor has developed, and which is being introduced with the release of "White Christmas." It will also be used on all subsequent VistaVision pictures.

The negative will be handled in 2,000 foot rolls corresponding to the 1,000 foot rolls of normal film. Negative cutting of Paramount VistaVision pictures will be the so-called A and B process, so that all dissolves and fades will be made from the original negative without duping.

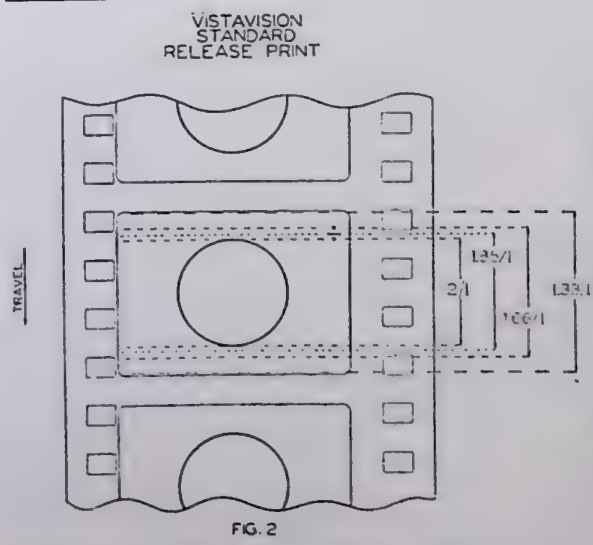


FIG. 2

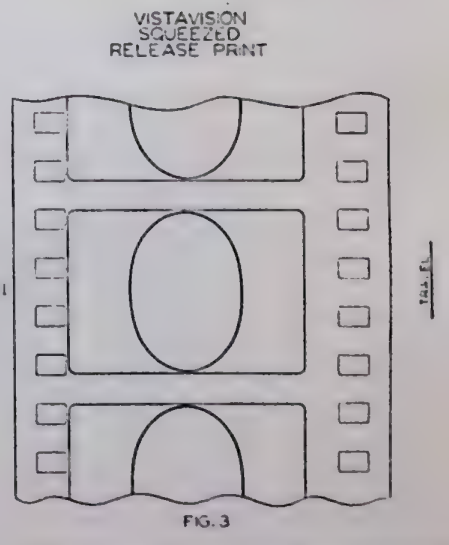


FIG. 3

FIGURE 2 indicates standard release print and outlines the various aspect ratios that can be used. Figure 3 is an anamorphic print.

If Eastman release prints are required by the foreign department, we feel sure that the VistaVision double-frame negative will give a better inter-negative for such release printing than could be obtained by any other system. In this case fine grain double-frame master color separation prints will be made from both the A and B negative for each reel. The printing in this case will be by the so-called A and B method (similar to 16mm color printing) onto the intermediate color negative which in turn will be used for release printing in the overseas laboratories.

The sound from all release prints will be made from the same type of sound negative, and as indicated before, all release prints can play on any standard optical sound head in any theatre in the world. Further, these same prints can play with stereophonic sound in theatres having a Perspecta Sound control unit.

frame on the dashed line, and if the picture is to be projected in the aspect ratio of 2:1, framing should be on the little dot below the dashed line. These framing indices will be placed so as to give adequate headroom and the best composition for the aspect ratio selected.

Squeezed Release Prints

For the exhibitors who wish complete flexibility in picture projection, Paramount suggests the purchase of variable prismatic expander lenses. VistaVision squeezed prints will be made available for those exhibitors desiring same. These squeezed prints will be made in the same manner and from the same negative as the standard prints, except that in optical reduction the picture area will be taken from the area of the negative that supplies the portion of the picture normally used in 2:1 aspect ratio projection from the standard print.

opinion of the writer the optics for a 1½:1 ratio will give better picture quality than a higher ratio.

THEATRE PRESENTATION

VistaVision standard prints can be projected in any theatre in the world with an improved picture quality. Further, viewing will be better than heretofore from the front and side seats. If the theatre is to take full advantage of the improved quality of the VistaVision print the theatre must have good projection equipment, and a large seamless screen. Motion picture studios expend hundreds of thousands of dollars in a meticulous effort to deliver the best possible technical quality, along with good entertainment. The theatres should accept their responsibility and make an equal effort in their exhibition.



DIAGRAM demonstrates VistaVision principle of comfortable viewing. It is claimed that this process covers all three viewing areas.

VistaVision Standard Release Prints

The VistaVision standard print is a standard release print in every regard except that the quality has been improved. This will give a new depth perception in exhibition.

These standard prints will carry a framing index (upper right hand corner of the frame, Figure 2) at the start of each 2,000 foot reel as a guide to the projectionist. If the picture is being projected in the old 1.33:1 aspect ratio, the projectionist will frame with the top frame line just above the top of the projected picture as in the past. If the picture is to be played in an aspect ratio of 1.66:1, the projectionist will frame at the little dot in the upper right-hand corner of the picture (the dot below the top frame line and above the dashed line). If the picture is being projected at 1.85:1, the projectionist will

If a circle is photographed it will appear on the negative as shown in Figure 1. In the standard release print the circle will still be round, as in Figure 2. In the squeezed print it will be oval as shown in Figure 3. The oval will then be expanded to a circle in projection by the variable prismatic expander lens.

In addition to gaining about 40 per cent in light on the 2:1 picture, this squeezed print has the possibility of having slightly better color saturation, and possibly (still to be proved) slightly better picture definition for large screen projection.

The squeezed ratio of this picture is 1½:1 as compared to the squeezed 2:1 which is used by CinemaScope. In the

Screens

Every theatre should install the largest feasible screen, both as to height and width. As a further recommendation in this regard, it is our belief that in the very large theatres they should install screens capable of accepting the aspect ratio of 1.85:1, unless the sight line for seats at the back of the main floor is limited by a low hanging balcony. In this case, the theatre may elect to install a screen in the ratio of 2:1. This is the only limitation that should force the theatre into an aspect ratio as high as 2:1. In theatres where the screen's width is limited to under 30 feet, and where there is adequate height, we recommend a screen aspect ratio of 1.66:1, reducing the height only when necessary for good viewing.

Objective Is to Fill Screen

One of the objectives of VistaVision

is to fill the screen. VistaVision is a flexible system and allows adequate latitude for filling the screen. In the preceding paragraphs we have named specific aspect ratios. However, the theatres should vary from these defined ratios as required to fill the screen.

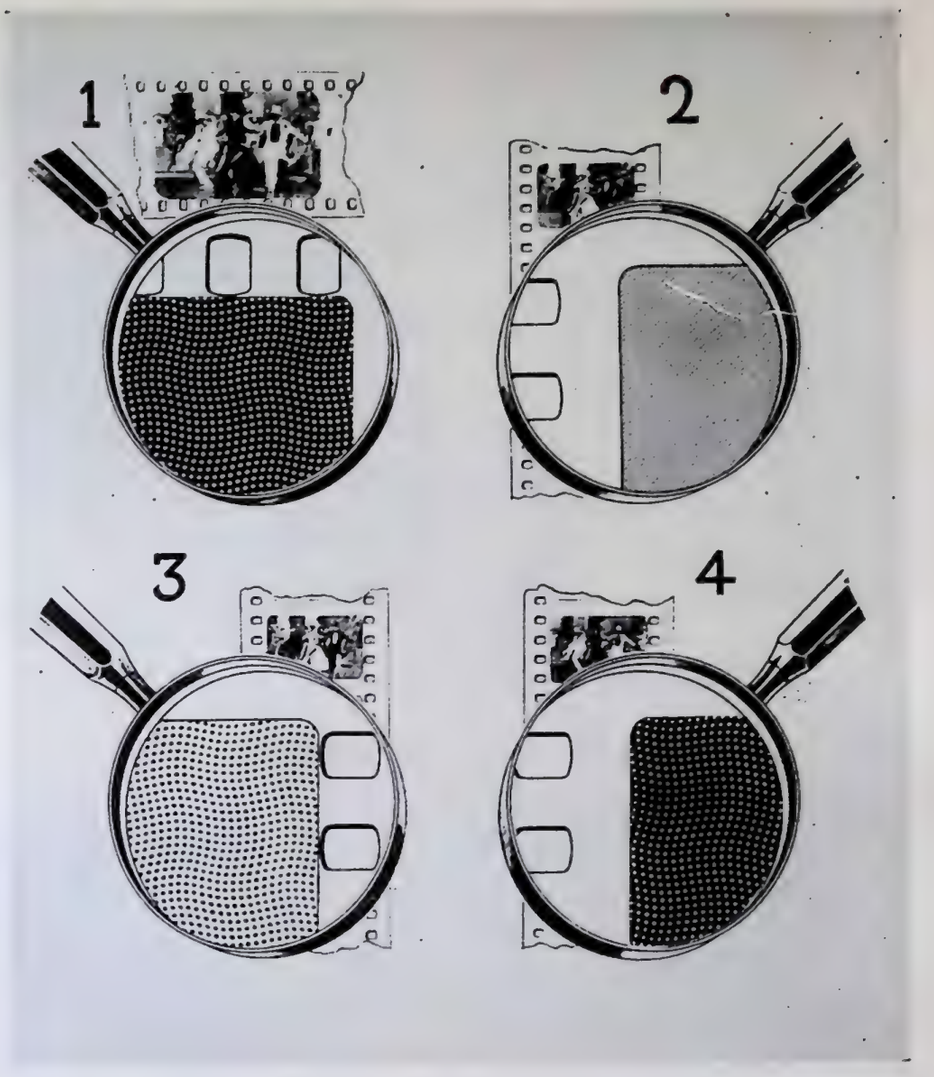
We realize that it is impossible to lay down fixed recommendations applicable to all theatres. We are, however, setting down some general principles and recommendations which can be used as a guide. With respect to picture size, in the past the most acceptable picture quality has been at a distance from the screen between two and five times screen width, this has been from 50 to 125 feet from the screen. On the basis of the same old picture quality, if the screen width were increased to 50 feet, the most acceptable picture quality would be between 100 and 250 feet from the screen. This reaches beyond the back wall in most theatres. If people are seated closer, they see film grain and the picture is fuzzy and tiring to the eyes. This applies to both straight and anamorphic projection of all previous pictures. VistaVision pictures, starting with White Christmas, can be viewed with ease and comfort from one-half to eight times screen width. With VistaVision on a screen 50 feet wide, the seating will be acceptable down to 25 feet from the screen and will be very satisfactory at 38 feet from the screen. This is the answer to front seating.

Side seating is also improved by the better definition and relative freedom from film grain which is accomplished by the VistaVision process.

There is also another "rule of thumb" method for determining best screen width—namely, "the best screen width should not be more than one-third the distance from the screen to the center of seating, and the screen width should not be less than one-sixth the distance from the screen to the back of the auditorium. The center of seating in most balcony theatres is about three-fourths the distance from the screen to the back row of seats." With the Paramount process this rule can be changed to "the screen width can be increased to one-half the distance from the screen to the center of seating." As an example, if a theatre is 100 feet deep, the best viewing will be on a screen 38 feet wide. The previous width for the old pictures would be 25 feet. As another example, if a screen 50 feet wide is installed in a theatre 100 feet deep, the screen will be too wide and viewing will be uncomfortable unless seats are moved back to at least 25 feet and preferably 38 feet from the screen.

With respect to screen height, Paramount has made a series of tests which indicate that the same scene always looks better and the actors can always be brought closer to the audience, as the height of the screen is increased with respect to width up to the ratio of 1.85:1 for large screens and 1.66:1 for smaller screens. This is in keeping with the recommendation made earlier in this writing.

Screen height, the same as screen width, is usually limited by the proscenium. However, screen height may also be limited in balcony houses by the maximum height that can be seen from the back row of the main floor where the sight line is eclipsed by the overhang of the balcony.



PICTURE QUALITY EXPLAINED: No. 1 shows that VistaVision negative covers two-and-a-half times the conventional size. Section under magnifying glass shows grain. No. 2 shows the VV print reduced to 35mm. size with grain reduction of 72 per cent. No. 3 shows the large grain found in a conventional negative frame. As seen in No. 4 VistaVision negatives are much sharper, thus giving a sharper picture.

We recommend curving metallic screens with a radius equal to the projection throw or in long narrow houses this radius may be increased to one and one-fourth or one and one-half times projection throw. We also recommend tilting the screen back slightly at the top in theatres that have very high projection angles. The angle of tilt should not be over one-third the projection angle, and the writer is opposed to tilting the screen over five degrees.

There is a tendency on the part of theatre men to select a metallized screen that has a uniform distribution across the house. Such a screen gives an inferior picture at the center of seating and seldom improves the side seats. For large houses we recommend purchasing a metallized seamless screen that has a light gain of two and one-half to one. A screen of this type will give much better viewing to the important and largest number of seats, and it will provide satisfactory light distribution throughout the theatre. In smaller theatres, seamless white screens can be used if adequate projection light is available.

All theatre screens should be seamless and if the screen now installed has bad seams, the screen should be replaced. One look at a good seamless screen, as compared to a screen with seams, is all that is necessary to convince anyone that a screen with bad seams should never be used.

In studies made by Paramount we find that seams become more apparent with time. Part of the trouble is no doubt due to an accumulation of dirt at the seams, and microscopic examinations also indicate that stretching at the seams deforms the screen surface in the adjoining area.

Projection Lenses and Aperture Plates

After the best screen size has been established, proper focal length high quality standard lenses should be obtained so as to gain the correct width of picture on the screen. Theatre supply companies have tables and can recom-

mend the proper focal length lens to give the desired picture width.

After determining the proper focal length lens, the projector aperture plates should be filed so as to project the proper shaped picture to meet the size of the screen that has been selected. If the screen carries black masking, the projected picture image should overlap the masking far enough to give a well framed picture.

Much has been said both for and against the practice of gaining proper picture shape by diminishing the opening in the projector aperture plates. The procedure is called "cropping." Our desire is to gain the best picture quality, and as long as cropping gives the best picture quality, we recommend cropping.

In considering cropping, most people think of a possible quality loss from the cropped print. The fact is that real loss is due to the restricted area of negative that is used to gain the cropped picture. The VistaVision negative is large, thus the loss does not occur with VistaVision. A loss does occur on the 2.55:1 anamorphic pictures when the aspect ratio is reduced by side cropping, and some loss does occur when pictures made from standard negatives are cropped.

"Cropping" is accomplished in the projector by using special projection aperture plates filed to the desired aspect ratio.

We make no specific recommendations in regard to projector type or projector lamp houses, except that in our experience with shorter focal length lenses, better screen illumination is obtained with lamp houses of the reflector type having mirrors 16 inches in diameter.

In theatres using very large lamphouses and high amperage, we recommend the use of water and air cooling, also dichroic heat reflectors.

Variable Prismatic Expander Lenses

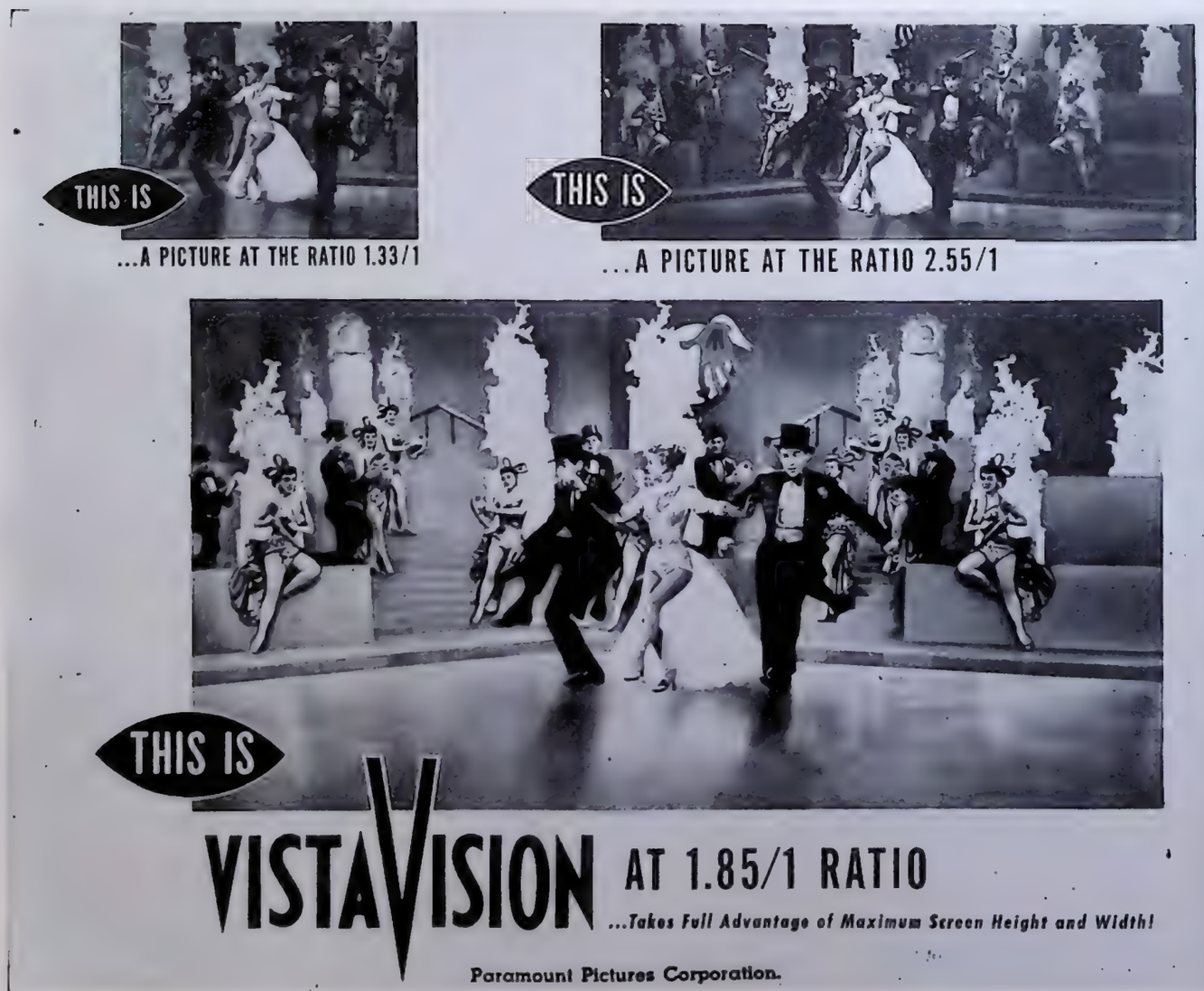
There is a great deal of confusion between aspect ratios and squeezed and/or expansion ratios. The aspect ratio is the ratio of width to height of the picture image on the screen, and/or the width to height of the picture image on the film. The squeezed and/or expansion ratio is the result of an optical change in a lens system. When the images are squeezed they are made to appear thin and tall. When these thin and tall images are expanded in projection, they appear normal on the screen.

In the CinemaScope system the camera lens picks up a scene that is 2.66 times as wide as it is high. This scene is squeezed horizontally in the squeeze ratio of 2:1, which gives a negative image in the aspect ratio of 133:1. A print made from this negative is still squeezed.

In CinemaScope projection, the image passes through an anamorphic expander lens which expands the image in the ratio of 2:1. This would normally give a screen aspect of 2.66:1. In the CinemaScope process the sides of the picture are cropped down to make room for the magnetic stereophonic sound tracks, so that the final aspect ratio of the picture when projected is in the ratio of 2.55:1.

In the VistaVision process, standard camera lenses are used in photography and a standard large negative image is obtained. When desired, squeezed prints are made during the process of optical printing, but in the case of VistaVision the squeeze ratio is 1½:1. When these prints are projected, they must be pro-

EXAMPLES of the different aspect ratios are illustrated here. Compare the old 1.33 to 1 ratio (top, left) with VistaVision aspect ratio. Then compare the 2.55 to 1 ratio aspect ratio (top, right). It is up to the individual to decide if the VistaVision ratio of 1.85 to 1 gives the clearest picture.



jected through an expander lens working in the ratio of 1½:1, which gives a screen image in a 2:1 aspect ratio.

At the present time there are three types of anamorphic lenses being manufactured. They are the cylindrical lens type, such as used by CinemaScope; the reflector lens type; and the prismatic type. Of these three types of lenses, the prismatic type is the only one that can be made variable. The variable prismatic expander lens, has the capability of projecting in any ratio of squeeze, from a ratio of 1:1 to 3:1. In the 1:1 position these lenses will project standard prints either of the old standard type or the VistaVision standard type. Thus, the variable prismatic expander lens provides complete flexibility in the projection booth for the exhibition of any print.

Theatre Sound

As stated before, all VistaVision release prints, both standard and squeezed, will have a single photographic sound track located in the standard position, so that they will reproduce on any standard optical sound head in any projector throughout the world. The sound track will also carry low frequency modulated control signals which will control the direction of sound reproduction in theatres that are equipped for directional or stereophonic sound.

Perspecta Sound will expand music to multiple loudspeakers and control the direction of the sound source when, and as it is required for dramatic effectiveness. Paramount suggests this type of sound for those exhibitors who desire multi-horn reproduction, and who wish to fill the theatre with sound. The decision as to its use rests with the exhibitor.

For VistaVision stereophonic sound it is only necessary to have three loudspeakers, as shown by A, B and C, in Figure 4. In very wide theatres and very large theatres, the addition of auditorium speakers at D and E may improve the sound effectiveness. These auditorium loudspeakers, if used, should be located well to the front of the auditorium. Loudspeaker D should be connected to the same electrical circuit as loudspeaker A, but operated at a lower level, and loudspeaker E should be connected to the same electrical circuit as loudspeaker C, and also operated at a lower level.

The control units for Perspecta Sound will be available from Westrex, Fairchild, Altec-Lansing, and other manufacturers. The theatre service companies will have complete instructions, in regard to their installation and operation.

Paramount will have no magnetic sound release. It is our opinion that this move will give greater simplicity and flexibility at a lower cost. The sound control units will have an automatic return to monaural sound in case of trouble.

Booth Operation

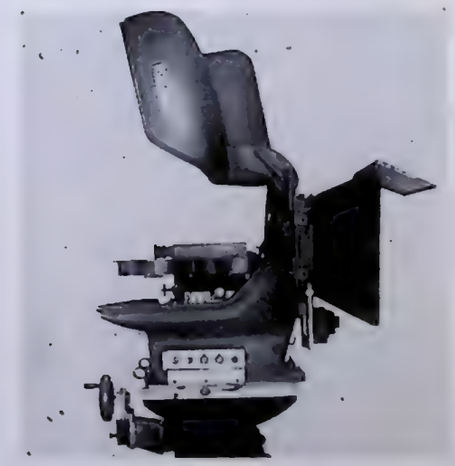
Booth operation is simplified to the bare essentials in all theatres that use the VistaVision standard prints and monaural sound. VistaVision also offers the simplest and most flexible system for those theatres that wish to play squeezed prints through variable prismatic expander lenses. VistaVision, with its directional sound, simplifies operation in theatres equipped with multi-speaker reproduction.

Drive-In Presentation

Drive-ins can use the VistaVision standard release prints and project them in the same manner as any standard release print. The improved quality of the VistaVision print should be very apparent in the outdoor theatres.

It seems to the writer that drive-ins can best be served by using a screen in the ratio of 2:1, and using the squeezed prints along with variable prismatic expander lenses, working at the expansion ratio of 1½:1, as established for the VistaVision prints.

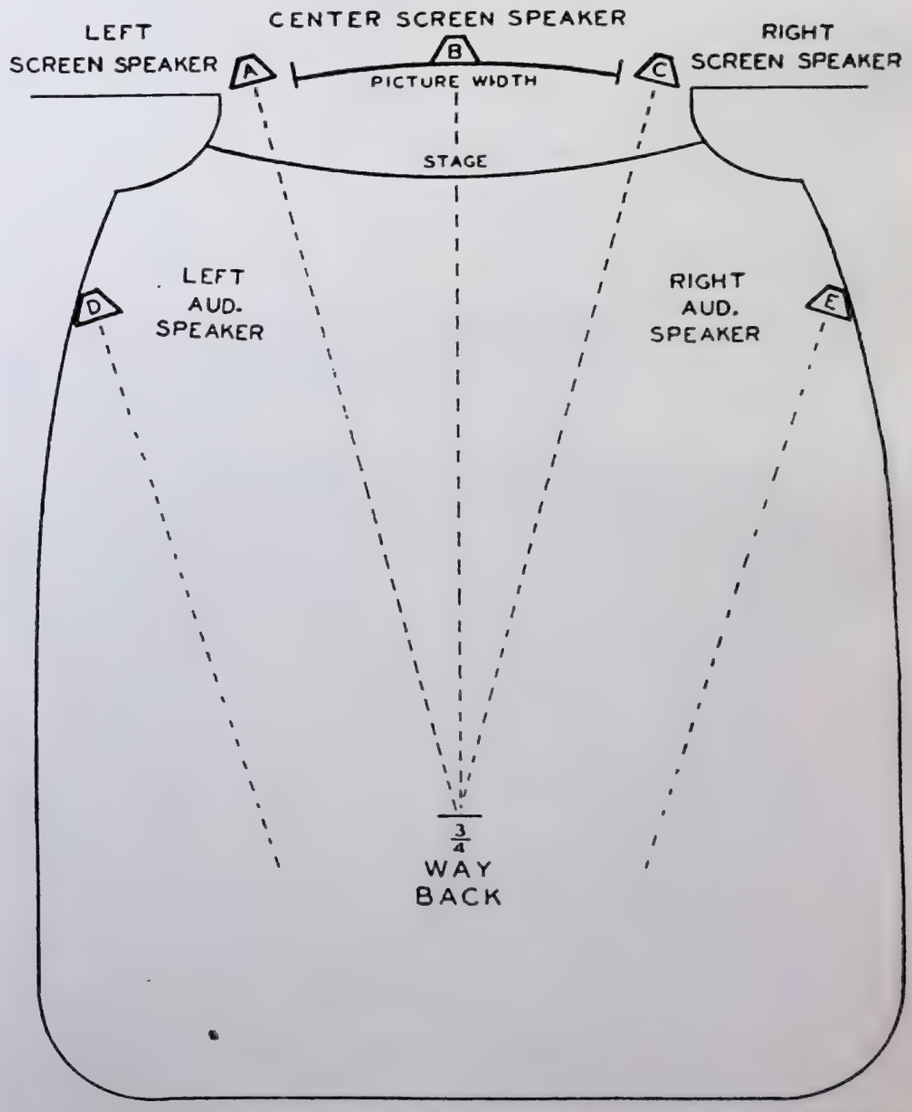
As stated previously, standard sound is available on all VistaVision release prints so that no change will be required in handling VistaVision sound for drive-ins.



ONE OF the first cameras to be adapted to the VV process (above). The Paramount recommended system for directional sound is at (right).

FIG. 4

PREFERRED SYSTEM WITH SIDE SPEAKERS JUST BEYOND SIDE LINES OF PICTURE



Wide Screen Light Requirements

An Analysis of the Light Requirements Necessary in Order to Project the Various Wide Screen Systems Satisfactorily

By Arthur J. Hatch
Engineering Vice-President
Strong Electric Corp.

BRIEF: *Since the introduction of the various wide screen forms of film presentation there has been a great deal of confusion as to the types of screens . . . lamps . . . aperture plates . . . etc. . . . needed in order to get the proper amount of illumination on the screen . . . This article is a summary of the various wide screen systems now in use . . . and an analysis of the light requirements . . . The feature covers CinemaScope . . . VistaVision . . . drive-ins . . . and many other areas of importance to the exhibitor . . . In addition . . . there is an interesting section devoted to the comparison of the light requirements of the different systems . . . Prepared in a simple straightforward fashion . . . this article should help clear up much of the misunderstandings regarding light requirements for the wide screen systems.*

That the wide screen is here to stay is confirmed by the policies and commitments of major film producers to release their future better pictures either in CinemaScope or VistaVision processes. With a blessing on these two systems given by most, if not all of the film producers, the exhibitor can proceed to equip his theatre with reasonable assurance that the equipment he purchases will be suitable for the projection of whatever wide screen system may eventually prevail.

Increased Screen Illumination

Those theatres that have already equipped for CinemaScope have learned whether or not they have ample screen illumination on the basis of their screen size. Theatres that have not as yet installed a large screen and may or may not have suitable projection lamps can approach the problem of solving their light requirements from two angles—first, that of determining how much light they will need to project a picture of the size which they intend to install; or second, determining how large a picture they can present with their present projection arc lamps. With both wide screen systems of projection with their vastly increased screen area there is a general requirement for more screen illumination than has been necessary heretofore.

As the matter of film apertures and aspect ratios has been pretty well established for these systems, it is possible to present a few facts and comparisons from which conclusions can be drawn that will obviate a period of expansive experimentation.

THIS CHART offers much valuable information about the requirements for wide screen systems.

Comparisons

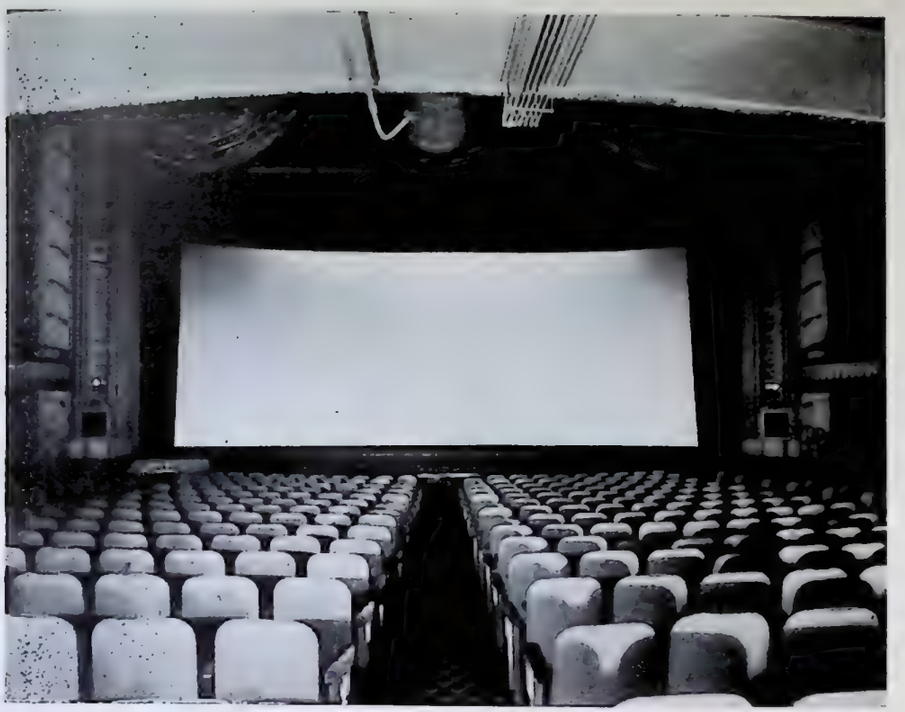
It is generally recognized that the maximum amount of light that can be put through present projection systems using present designs of powerful arc lamps and optical systems depends principally upon one factor, the area of the aperture. For instance, using the most powerful lamps, it is usually possible to put about 6500 lumens through a 16mm aperture. Using the same lamp it is possible to project approximately 23,500 lumens through a 35mm aperture, which has about four times the area of the 16mm aperture.

Since the amount of light which is available to the screen depends primarily upon the area of the picture aperture, to compare the requirements of the various projection systems it becomes necessary to examine them on an aperture area basis.

Most of the wide screen systems proposed use either an anamorphic type lens to expand the size of the picture or use a cut down aperture to accomplish the extended picture ratio. For instance, the non-anamorphic VistaVision system makes use of an aperture which is .825 inch wide (the same as the standard motion picture aperture which has been in use since the advent of sound) by .446 inch in height. These dimensions give an aspect ratio of 1.85 to 1 to the picture when projected with a non-anamorphic lens. This aperture has an area of .368 square inch.

SUMMARY OF WIDE SCREEN PROJECTION SYSTEMS

System	Aperture Size	Aperture Area sq. in.	Lumens thru Aperture	Type of Screen	Picture Aspect Ratio	Screen Size 4 ft. lamberts Center	Width Ratio Factor
Standard	.825 x .600	.495	23,500	matte white	1.33:1	66 x 50	1.00
VistaVision non-anamorphic	.825 x .446	.368	17,500	matte white	1.85:1	66 x 36	1.00
VistaVision anamorphic	.825 x .600	.495	23,500	matte white	2:1	78 x 39	1.18
VistaVision non-anamorphic	.825 x .446	.368	17,500	aluminized	1.85:1	89 x 48	1.35
CinemaScope-anamorphic optical sound	.839 x .715	.600	28,500	matte white	2.35:1	92 x 39	1.40
CinemaScope-anamorphic magnetic sound	.912 x .715	.652	31,000	matte white	2.55:1	100 x 39	1.52
VistaVision-anamorphic	.825 x .600	.495	23,500	aluminized	2:1	102 x 51	1.55
CinemaScope-anamorphic optical sound	.839 x .715	.600	28,500	aluminized	2.35:1	122 x 52	1.85
CinemaScope-anamorphic magnetic sound	.912 x .715	.652	31,000	aluminized	2.55:1	133 x 52	2.00



THE screen at the State Lake Theatre, in Chicago, is opened to the full CinemaScope aspect ratio.

The system whereby VistaVision employs anamorphic prints uses the present standard aperture .825 by .600 inch and obtains the wide screen effect with an anamorphic lens that has a magnification of 1½ to 1. As the ratio of the standard aperture is 1.33 to 1 and is anamorphized with a 1½ to 1 ratio, the total aspect ratio of the final projected picture is 2 to 1. This standard aperture has an opening area of .495 square inch.

The CinemaScope projection system makes use of a still larger aperture, one that is .912 by .715 inch. The extending of the width of this aperture was made possible by relocating the sound tracks, as was done with the stereophonic magnetic sound on the CinemaScope print. The area of this aperture is .652 square inch, the largest of the systems used for general release and consequently it will pass the most illumination. The CinemaScope aperture has an aspect ratio of 1.27 to 1, and is used in connection with a 2 to 1 magnification anamorphic lens to give the projected picture a resultant ratio of 2.55 to 1.

The recent decision to release optical prints in CinemaScope necessitates the use of an .839 by .715 aperture or ratio of 1.17 to 1 which when projected by the regular 2:1 anamorphic lens results in a picture of aspect ratio 2.35:1. Area of this aperture is .600 square inch.

Comparing the light that can be put through these four apertures, we have the old standard width cut down VistaVision aperture with a 1.85 to 1 ratio to which we will assign a value of 100 units, based on the area of .368 square inches. Accordingly, to the .825 by .600 aperture used with the 1½ to 1 ratio anamorphic lens, and which has an area .495 square inch, we must assign a value of 135 units since this size aperture passes 35 per cent more light than the first described aperture. It follows then that the CinemaScope optical track aperture, with an area of .600 square inch rates 163 units, since it projects 63 per cent more light than the first described aperture.

The CinemaScope magnetic print aperture with an area of .652 square inch projects 77 per cent more light than the first described aperture or 177 units.

Since the powerful lamp, referred to previously, without projector shutter running, puts 17,500 lumens through the non-anamorphic VistaVision aperture, it follows that 23,500 lumens can be put through the anamorphic VistaVision aperture, 28,500 through the optical CinemaScope aperture, and 31,000 lumens through the CinemaScope magnetic print aperture.

An Example

Taking the example of a drive-in theatre which has been equipped with the most powerful arc lamps projecting to a 66 by 50 feet white screen with the standard 1.33:1 aspect ratio, it is interesting to compare the size of pictures that can be obtained with each of these new wide screen projection systems to obtain the identical unit brightness on the screen in all cases.

Taking the case of the non-anamorphic VistaVision system, and assuming the picture will be projected to a matte white painted screen, the width of the screen that can be utilized would be 66 feet. In the case of anamorphic type VistaVision, the width of the screen that can be accommodated would be 78 feet wide, optical print CinemaScope screen width could be 92 feet, and in the instance of magnetic track CinemaScope the screen width could be 100 feet. All figures given for systems using anamorphic lenses have recognized the existence of a light loss of about eight per cent introduced by the anamorphic lens attachment.

If the screen, instead of having a matte white surface is an aluminized paint surface with a reflection factor



THE SCREEN at the Ames Theatre, Dayton, Ohio, is opened to the VistaVision ratio of 1.85 to 1.

of approximately 1.4, the non-anamorphic VistaVision picture width could be 89 feet, the anamorphic VistaVision 102 feet, the CinemaScope optical picture 122 feet, and the CinemaScope magnetic track picture 133 feet in width, which incidentally, is about the maximum size that is being used in present day drive-ins.

The accompanying chart shows these various figures for the different types of projection systems and different types of screens. All the figures shown are based on the use of the most powerful projection arc lamp available today and the sizes of the screen are calculated so that a brightness of four foot lamberts will be obtained in the center of the screen when the shutter is running. This figure of four foot lamberts is a little bit above the average brightness we find in most drive-in theatres today.

Screen Widths

To explain how these screen widths have been arrived at, take, for example, the magnetic track CinemaScope system which is calculated to have a 133 foot width for four foot lamberts center brightness.

When the center brightness on a screen is four foot lamberts, and with the typical distribution pattern, the average brightness over the whole surface of the screen is found by test to be 2.9 foot lamberts.

With a screen having a reflective factor of 1.4 it is only necessary to project 2.05 foot candles to the screen to realize the 2.9 foot lamberts brightness. The 31,000 lumens which this powerful lamp can deliver through a CinemaScope aperture and standard f2.0 optics is reduced by the 50 per cent shutter loss and the eight per cent lens loss so that the incident light on the screen is 14,350 lumens.

Therefore, since lumens are the product of average foot candles times screen area, we obtain the area that we can illuminate to this 2.05 foot candles intensity by dividing 14,350 by 2.05 for a resulting screen area of 7000 square feet. The picture width can be computed by taking the square root of the product of screen area times screen aspect ratio, which in the example calculates to 133 feet wide. The other calculations in the chart were made in a similar manner for the other projection systems and screens.

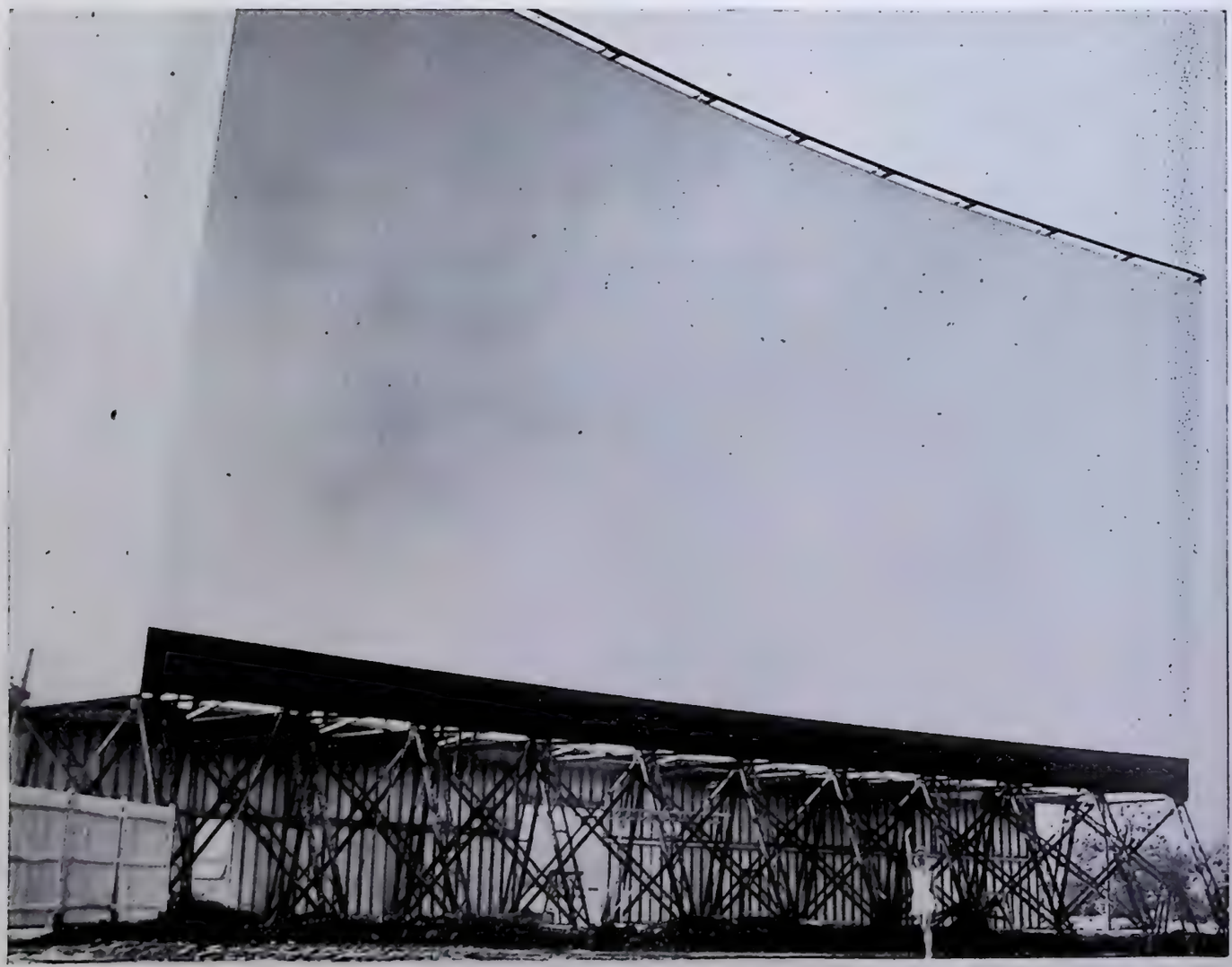
Assuming any particular theatre to have ample screen illumination on a matte screen using standard size aperture, the screen width that can be illuminated to the same brightness for any of the wide screen systems can be calculated by multiplying the present screen width by the "width ratio factor" given in the last column of the chart.

For example, if your own theatre presently has a 50 foot wide picture with standard projection on a white screen, and you wish to determine the width of matte white screen that can be illuminated to the present level of brightness with the VistaVision anamorphic system, simply take the present standard picture width and multiply it by the "width factor ratio" of 1.18 from the chart. The resultant width in this example would be 59 feet.

The illusion of living presence, the sole advantage of all the new screen techniques, can only be realized with an increase of screen width of from 1.75 to 2 times over that heretofore employed for standard projection.

Accordingly it is readily evident that most theatres will require the most modern and powerful projection arcs in order to meet the requirements of a sufficiently increased screen width for proper presentation of all wide screen techniques.

IN ORDER to get a properly lighted picture on huge drive-in screens, such as the one at the Westbury, Westbury, Long Island, there are many factors which must be taken into consideration. An important thing to be considered is how the screen is faced, as different materials give different results.



Basic Principles of Stereophonic Sound*

An Important and Fundamental Study of the Principles of Stereophonic Sound is Offered by A Leading Sound Expert

By WILLIAM SNOW
Sound Consultant

BRIEF: ***Stereophonic sound has become of vital importance to the industry. The subject has been studied for many years . . . but the published material is scattered . . . This paper summarizes the fundamental theory underlying stereophonic sound so far as it has been published . . . and gives examples of how the theory is employed in representative practical situations . . . Fundamental differences between ordinary binaural listening and stereophony are pointed out . . . as well as similarities . . . It is shown that much qualitative but little quantitative information has been reported . . . Factors which aid some stereophonic effects are shown to be detrimental to others . . . and methods of minimizing the undesirable conditions are suggested.***

In 1941 K. de Boer wrote: "When the time comes to make use of stereophonic reproduction in the cinema, in broadcasting, etc., and the opinion becomes more and more general that the improvement in quality so obtained is worth the trouble, it will become necessary in the first place to find a process of making stereophonic records on a large scale." Although even at that time stereophonic reproduction was far from new, de Boer's enthusiasm for "making an orchestra plastically audible" was shared by only a few. Now the time he forecast has finally come. Stereophonic sound has suddenly become of vital concern to the motion picture and sound recording industries, with multiple-channel recording the order of the day.

Stereophonic reproduction brings a truly remarkable increase in the realism of the sound and in the pleasure of listening to it. In one attempt to measure this quantitatively, reported by Fletcher, the observers listened alternately to single-channel and stereophonic reproduction. In the stereophonic channels low-pass filters were inserted, while the single channel was maintained flat to 15 kc. Half of the observers still preferred stereophonic reproductions when the low-pass cutoff was reduced to about 5 kc. However, this paper is concerned primarily with the mechanism of stereophonic sound rather than its advantages, which are now so well recognized.

*Most of this article appeared as a paper in the November, 1953 issue of the Journal of the Society of Motion Picture and Television Engineers, and is presented with the permission of the SMPTE.

DEFINITIONS

As in most new developments, differences in nomenclature have arisen which tend to obscure precise descriptions of systems. The words "binaural" and "stereophonic" are those most frequently used, but not with uniform meanings. This is not a new phenomenon. Alexander Graham Bell writing in 1880 referred to the "stereophonic phenomena of binaural audition," in describing experiments on the directional sense in hearing conducted with his newly invented telephone. The following definitions apply to the discussions of this paper, and are limited to electroacoustic sound reproducing systems:

Binaural — A system employing two microphones, preferably in an artificial head, two independent amplifying channels, and two independent headphones for each observer. This duplicates normal listening.

Stereophonic — A system employing two or more microphones spaced in front of a pickup area, connected by independent amplifying channel to two or more loudspeakers spaced in front of a listening area. This creates the illusion



THE ORIGINAL two channel stereophonic sound system is shown in the foyer of Philadelphia Academy of Music back in the year 1932.

of sound having direction and depth in the area between the loudspeakers.

It is very important to distinguish between these systems. A binaural transmission system actually duplicates in the listener's ears the sounds he would hear at the pickup point, and except that he cannot turn the dummy head, gives full normal directional sense in all directions. A stereophonic system produces an abnormal sound pattern at the listeners ears which his hearing sense interprets as indicating direction in the limited space between the loudspeakers. It has been aptly said that binaural systems transport the listener to the original scene, whereas the stereophonic sound system transports the sound source to the listener's room.

Electro-Acoustic Sound Reproducing Systems

Outstanding differences and similarities of the various types of electro-acoustic reproducing systems are summarized in the chart of Figure 1. The "System" names in column 1 conform to a uniform pattern and will be found in the literature, except "monophonic" which is used for convenience as the opposite of stereophonic. "Equivalent Normal Experience" refers to the everyday hearing experience that most closely parallels listening over the systems in question. The next four columns are obvious. The column "Direct Sound Reproduction of Single Source Pulse" is probably the most important, since it gives the basic differences between the sound reproduced by the various systems. If a single sound pulse is produced by the source, this column gives the characteristic of the resulting direct sound pulses at the observer's ears. The direct sound is the initial sound transmitted directly from source to observer by the shortest path, and arriving before any reflected sound arrives. It has been found that the direct sound carries the information, making angular perception possible, and it will be referred to frequently in what follows. Reverberant sound arrives from many angles and confuses the directional perception if too great in intensity. The "Remarks" column gives qualifying comments concerning the sound reproduction of each system. The reasoning behind these remarks is given in the body of the paper.

BINAURAL REPRODUCTION

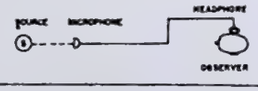
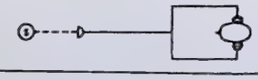
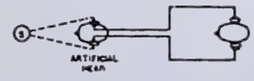
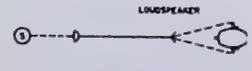
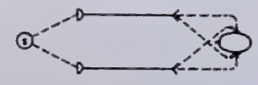
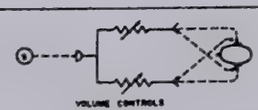
Binaural reproduction as used herein means ordinary two-ear listening since the reproducing system transmits a faithful copy of the original to the listener's ear.

Angular Localization

The properties of hearing which give the directional sense in binaural listening have been studied extensively. For pure tones angular localization is produced partially by phase differences at the two ears caused by the difference in distance from source to the ears, as the source angle changes. The phase effect becomes ambiguous somewhat above 1000 cycles because at short wavelengths more than one angle results in the same phase difference. However, in the higher frequency region intensity differences produced by the diffraction or sound-shadow effects of the head and external ears become great enough to give angular localization.

The great majority of sounds are not pure tones, but complex. For complex sounds the equivalent effects are arrival time and quality difference. A complex wave pulse has an initial wavefront which arrives at the near ear a short time before it arrives at the far ear. It is this small time difference which is used by the hearing sense to determine small angular variations, particularly for sounds near the median plane (straight ahead). It is characteristic to turn toward a source to locate it with maximum precision, and for impulsive sounds such as speech or clicks, differences as small as 1 degree to 2 degrees can be perceived. These angles correspond to arrival-time differences of about 10 to 20 *usec*, and the maximum possible difference, for a source in line with the two ears, is only about 700 *usec*, The loudness differences at such small angles are negligible, and it must be assumed that the arrival-time differences give the localization clues. On the other hand, it is not possible for the mechanism of a single ear to distinguish such short time intervals; this "decoding" of the arrival time differences must be accomplished by the brain.

FIGURE 1 is a chart summarizing the various types of electroacoustic reproducing systems.

Type of system	Equivalent normal experience	Pickup	Number of channels	Reproducer	Symbolic schematic	Direct sound reproduction of single source pulse	Remarks
Monaural	One ear plugged	1 Microphone	1	1 Headphone		1 Pulse to 1 ear	Only partial equivalence, as directional effects are not duplicated
Diotic	Sound source in median plane only	1 Microphone	1	2 Headphones		1 Pulse to each ear 0 time difference No quality difference	Only partial, as directional effects of elevation not duplicated. No directional effect of room reverberation Qualitatively much superior to monaural
Binaural	Normal listening, head stationary	2 Microphones in artificial head	2	2 Headphones		1 Pulse to each ear 0 to 0.6 msec time difference Normal quality differences	Directional and quality effects of normal listening in *pickup room duplicated* throughout *360° sphere* *No* listening room effects Observer cannot turn to face virtual source
"Monophonic" ordinary loudspeaker	Sound coming through a hole in a wall	1 Microphone	1	1 Loudspeaker		1 Pulse to each ear 0 time differences No quality differences	Both ears used—binaural listening to a single fixed sound source position Composite of pickup and listening room acoustics Listening room reverberation has directivity Represents widely spaced "effects" loudspeakers
Stereophonic	None	2 or more microphones	2 or more	2 or more loudspeakers		2 or more pulses to *each* ear 0 to 30+msec time differences Complex quality differences	Depends on fusion of multiple pulses by ears Directional and quality effects of normal listening *simulated* for a *limited angular area* appearing as part of *listening room* 360° simulation would require a large number of channels Composite of pickup and listening room acoustics Reverberation has partial directivity in pickup room, full directivity in listening room Observer can turn to face virtual source Time differences from both source and observer positions
Pseudo or bridged stereophonic	None	1 Microphone	2 or more	2 or more loudspeakers		2 or more pulses to *each* ear 0 to 20+ msec time differences Small quality differences	Single source only Many properties identical with true stereophonic system Time differences *only* from observer position, and detrimental Identical signal-reverberation pattern from each loudspeaker Identical quality from each loudspeaker Many other bridged combinations possible

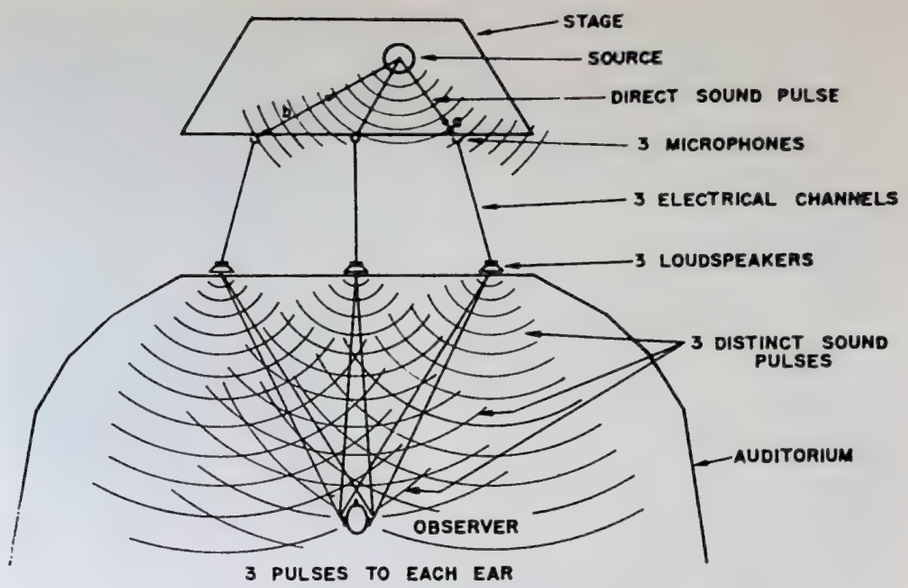


FIGURE 2 is an actual 3-channel stereophonic system. A practical system gives a multiple reproduction of the original sound which the observer interprets as coming from single source.

The arrival-time effect is aided by the quality differences at the ears caused by sound diffraction. Quality differences also change most rapidly near the median direction; consequently, angular localization is much less precise at the side than in front or back.

Changes in both arrival time and quality are relatively small as a source is elevated in front of an observer. Therefore, the ability to distinguish angle in the vertical direction is relatively poor.

The statement is made in Figure 1 that the observer cannot turn to face the source. While systems have been constructed with servo connections between observer and dummy, thereby localization, this is not practicable for a system used with multiple observers, or with a recording link.

Depth Localization

Perceiving the position of a sound source in space involves the determination of distance as well as angle. The ear has no mechanism corresponding to that of the eye for converging on the source, and must depend on less definite clues. In the absence of reverberation, the only information given is intensity and quality. From past experience the ear can form an approximate idea of distance from its interpretation of the absolute loudness of a sound, and from its judgment of quality differences produced by atmospheric absorption. These comparisons are made with a mental image of what the sound should be. In the presence of reverberation, the ear can judge distance based on the ratio of direct to reverberant sound. Since neither of these methods is precise, judgment of distance is much less accurate than perception of angle. Probably everyone has had the experience of badly misjudging the distance of a sound heard for the first time, whereas no difficulty was experienced in determining its direction.

Fundamental Difference from Stereophonic Sound

This discussion of the determining physical factors underlying ordinary binaural hearing has been given at some length to lay a foundation for the discussion of those underlying stereophonic reproduction. There are basic differences which have been almost universally overlooked. When this confusion is cleared up, stereophonic reproduction can be used with much greater ease and satisfaction.

STEREOPHONIC REPRODUCTION

It has become customary to describe stereophonic reproduction as follows: A screen consisting of an extremely large number of extremely small microphones is hung in front of the sound source. Each microphone is connected to a corresponding extremely small loudspeaker in a screen of loudspeakers hung before the audience. Then the sound projected at the audience will be a faithful copy of the original sound, and an observer will hear the sound in true auditory perspective. It is then stated that such an impractically large number of channels is not needed and that good auditory perspective can be achieved with only two or three channels. These are true statements, and the natural interference from their juxtaposition is that far less than faithful "space" reproduction of sound will give localization by ordinary binaural mechanisms.

When we proposed this theory early in our studies of stereophonic phenomena, we realized that there were fundamental differences which were not fully understood, and pointed out the multiple source effect in connection with our loudness calculations. Apparently this has not been sufficiently emphasized. The experience of the intervening 20 years has convinced this writer that this natural inference is mistaken, and has caused the confusion postulated in the previous section.

The myriad loudspeakers of the screen, acting as point sources of sound identical with the sounds heard by the microphones, would project a true copy of the original sound into the listening area. The observer would then employ ordinary binaural listening, and his ears would be stimulated by sounds identical to those he would have heard coming from the original sound source. As shown in Figure 1, this means one direct-sound pulse to each ear for a single pulse from the source.

Operating Conditions

Figure 2 illustrates the conditions for a typical setup where only three channels are used. This arrangement does indeed give good auditory persepective, but what has not been generally appreciated is that conditions are now so different from the impractical "infinite screen" setup that a different hearing mechanism is used by the brain. Each individual loudspeaker sends a pulse to

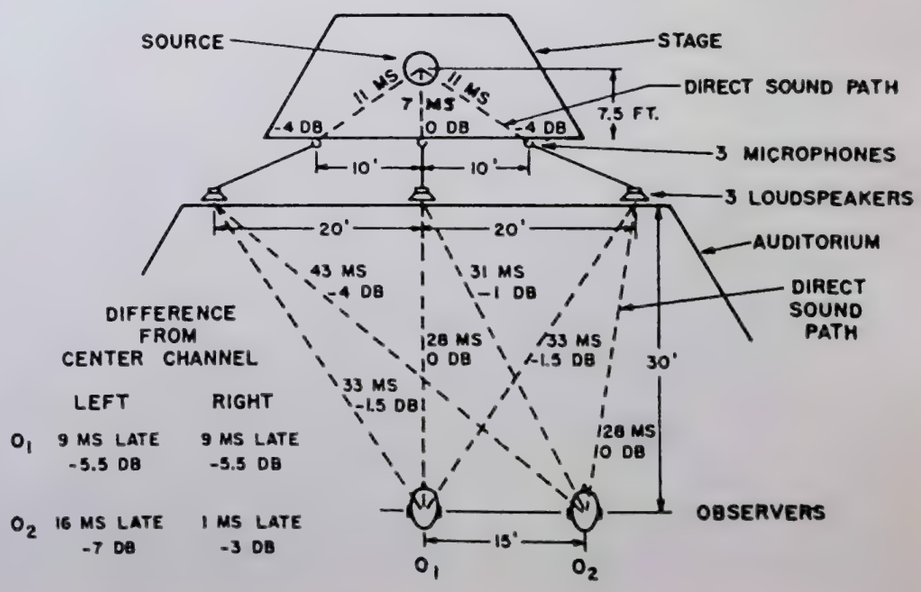


FIGURE 3 shows the effects of changing listening location. As the observer moves away from the center-line of the auditorium the sound increases in its intensity from the "near" loudspeaker.



ELECTRICAL EQUIPMENT used in the 1932 system, installed in the basement of Philadelphia Academy of Music. The author can be seen at right.

the observer. He therefore receives three faithful copies of the sound at each ear in rapid succession. The time differences between these pulses are too short to allow the ear to distinguish them as separate; consequently the hearing mechanism fuses them into an illusion of a single sound pulse coming from a virtual sound source located somewhere in the space between the outer loudspeakers. The time differences are short, but still long compared to the maximum of 700 *usec* to which the ears are accustomed in normal listening. Thus this type of listening falls outside of normal experience, but fortunately the brain is able to form a single concise impression from what might be expected to be a confusing set of signals sent by the ears.

The closest parallel is reverberation. But while there are distinct similarities, the three direct-sound pulses arrive ahead of any reflections other than the floor reflections which do not have individual directivity. In addition, they are separate and distinct, of high fidelity, and in compact directive pattern. The reverberation follows as a "smear" of echoes of random directivity, and does not create a virtual source illusion.

The problem then in stereophonic reproduction is to produce multiple sound images at the ears of the observer which will fuse in such a way as to give the desired illusion of sound origin.

Angular Perception

Intensity Differences — What are the characteristics of the direct-sound pulses which cause them to give the observer the sensation of angular localization of the virtual source? The most obvious difference is intensity of sound projected by the several loudspeakers. These differences are caused by the varying distances of the source from the various microphones. When the source moves close to a microphone the output of the corresponding loudspeaker is greater than that of the other loudspeakers, and localization tends in its direction. The virtual source therefore moves in the same direction as the real source, and with proper system design can be made to have essentially proportional movement. In the original paper Dr. Steinberg and this writer discussed this in detail and proposed a theory for the effect of these intensity differences based upon the total loudness that would be produced in each ear by the total direct sound from all loudspeakers, taking into account the directivity of hearing caused by the shape of the head. While the agreement between the theory and experimental results was by no means perfect, and the differences were pointed out, the theory did appear to account for the main effect. This theory has been questioned by other experimenters, principally, it is believed, because of the common confusion between the mechanisms of ordinary binaural hearing and stereophonic hearing which the disscussion above should have now dispelled.

While a true understanding of the process is highly desirable, for the purposes of this paper it is not necessary to be certain of the precise physiological and psychological mechanism involved. It is well established that intensity differences in the channels are an extremely important contributor to angular perception. With positions of source and observer fixed so that all other factors are constant, variation of the gain controls in the channels can shift the virtual source to any angular position in the reproducing area. This is true for any combination of source and observer positions. In practice this is important because gain is easily controlled, to correct faults in pickup, or to enhance angular movement. The bridge-microphone system of Figure 1 operates on this basis, since the only differences that can be given the loudspeaker outputs must be obtained from electrical controls in the channels. As this is written many pictures are being made "stereophonic" by the use of volume controls in bridged channels from sound tracks originally recorded for single channel or "monophonic" reproduction. The pseudo-stereophonic system has its place; but it is not a satisfactory substitute for a real stereophonic pickup. It does not have the benefit of the other aids to angular or depth perception described; and in particular it can be used on only a single source at one time so that an individual source and "pan-out" must be supplied for each sound.

Quality Differences

If the microphones have varying directivity with frequency, there are quality differences as well as intensity differences in the channels as the source moves. Angular localization is definitely affected by this. It has been found that the higher frequencies where the head has relatively high directivity, contribute most to stereophonic localization. Localization tends toward the loudspeaker giving greatest high-frequency output, if the overall loudness is the same.

The very low frequencies contribute essentially nothing to stereophonic localization. For example, poor localization results if 1000-cycle low-pass filters are inserted, and no difference in localization is produced by eliminating frequencies below 300 cycles. It has been found that much of the stereophonic effect is preserved if low frequencies are reproduced from only one low-frequency unit and side channels reproducing only frequencies above 300 cycles are employed. This is of great practical value for economical stereophonic reproduction such as home music systems. For the flexibility and high fidelity

demanded by motion picture and auditorium reproduction its use appears questionable until a great deal more study of it has been reported. The Philips test employed microphones a small distance apart; with widely spaced microphones characterizing the practice in this country, serious pickup difficulties can be foreseen, as well as "crossover" complications in the loudspeaker systems. For "special effects loudspeakers" however, the low frequencies do not appear necessary if the main object is to obtain localization.

Arrival-Time Difference

Another phenomenon affecting angular localization is the change in arrival time of the direct-sound pulses from the several loudspeakers as the source moves upon the stage. These differences were mentioned above, and were shown to be considerably greater than those ordinarily encountered in simple binaural hearing. For example, in Figure 2 the right and left channels reproduce sound pulses from the source later than the center channel by time intervals corresponding to distances a and b respectively. The observer does not recognize the three pulses as distinct. However, it has been shown, that localization tends towards the loudspeaker which reproduces the earliest pulse. These effects have been called "Fusion" and the "Precedence Effect" by Wallach, Newman, and Rosenzweig. Qualitatively their discussion applies to stereophonic reproduction in general, but the precise data on precedence is limited to time differences of 2 msec or less, whereas common stereophonic conditions produce differences much greater than this. The following qualitative statements are deduced from this writer's own experience:

(a) The effect of arrival time is to make localization tend toward the loudspeaker from which the pulse arrives first.

(b) This effect is strong for small differences, say up to 3 or 4 msec, and tends to become weaker for greater time differences.

(c) The effect is relatively independent of where the differences are produced, whether on the pickup stage, in the listening room, or in the reproducing channels. Therefore differences in one section add to those in another, or can be made to compensate each other.

(d) These effects can be largely compensated by intensity or quality differences inserted in the channels, for any one observing position.

This effect acts to reinforce the intensity effect for movement on the pickup stage. As a source moves toward a microphone the arrival time is advanced at the same time that intensity is increased. This is one of the important factors not duplicated by the bridged system. An interesting application is described by Grignon in the triangular microphone arrangement for assuring center localization while maintaining stereophonic quality for a soloist or small source. Here the small advance of arrival time on the center microphone holds localization to the corresponding loudspeaker.

Reverberation

A fourth factor that might contribute to angular localization is ratio of direct to reverberant sound. Experience has shown, however, that it plays a very minor part in angular localization.

Dynamic Localization

Moir and Leslie provide a very interesting observation on localization, as follows: ". . . dynamic localization of a source appears to be appreciably more accurate than is shown by the data obtained from localization tests on a stationary source. This applies to all variations of two and three channel systems that we have compared."

Depth Perception

Depth perception in stereophonic reproduction is controlled by essentially the same factors as in ordinary binaural listening described above, viz: absolute intensity, quality, and ratio of direct to reverberant sound. As the sound intensity decreases, the impression is produced of the sound moving away. The same illusion accompanies a relative loss of high frequencies. The most important contributor to the feeling of depth, however, is change in the ratio of direct to reverberant sound on the pickup stage. As the reverberant energy becomes more prominent, the source appears to recede on the virtual stage. In practice the microphones are closer to the sound sources than listeners would be, and changes in direct-to-reverberant sound ratio can be heightened to give more definite impressions of depth on a virtual stage than are created on a real stage. As in ordinary listening, however, depth localization is less precise than angular localization.

Effect of Observer Position

Up to this point for the sake of simplicity, the paper has been written as if all observing positions were equally good. Actually this is far from the case, as all experimenters have pointed out. From the standpoint of the practical use of stereophonic reproduction in thea-



BINAURAL system employing two microphones in dummy head, connected individually to an earphone for each ear used in 1932 experiments.



THE HOLLYWOOD Bowl shell with decorative cloth columns hiding loudspeaker platform in 1936.

tre, this is a truly serious problem. Here the very factors which produce the stereophonic effect prove a disadvantage in some aspects, and measures must be taken to compensate them.

Source Position Shift as Observer Moves — The effects so far described characterize listening at the position of Figure 2, or other listening positions on the center line where the distances to the side loudspeakers are equal. They also apply to other observing positions qualitatively, but as the observer moves away from the center large shifts of virtual source position may occur. The stereophonic feeling of spaciousness is preserved, and virtual sources continue to move, but they are not localized at the same place on the stage by all listeners as they would be on a real stage.

Figure 3 illustrates what is happening for a source at center of the pickup stage, and a typical setup. Observer 1 receives identical direct sound pulses from the two side channels. Ever here, however, the center-channel sound arrives slightly ahead of that from the sides, and at greater amplitude. In practice, the center channel is operated at lower gain than the side channel to correct for this.

Observer 2 at the right, receives pulses from the three loudspeakers with the relative times and intensity level shown. It is seen that the righthand loudspeaker now contributes both more intense signal and an earlier signal than before; and both of these effects are known to make localization tend in this direction. This is indeed the case, and as the observer moves to the right the virtual source position moves in the same direction. Note that the differences in time are several milliseconds. Qualitatively (again based upon personal experience) it is found that a considerable shift takes place for small observer deviations from the center, where relative intensity changes are small. These must be ascribed to changes in arrival time. For any given observer position these shifts can be compensated by changes in channel gains, and appear to become relatively constant at anything over a few milliseconds. Obviously the effects of intensity increase can be overcome by unbalancing the channel gains.

Methods of Reducing Shifts — The United States Patent 2,137,032 contains a suggested method of alleviating these troubles. The loudspeakers would be so designed as to project a delayed signal and one of reduced intensity in the forward direction compared to the side directions. This would tend to equalize conditions for the various observing positions.

Suppose that observer 2 remains at the right while the source moves to the left. The intensity increases in the left channel, but more important, the arrival times become more nearly equalized, and the virtual source moves toward the left. Only the intensity change is duplicated in the bridged channel, so that there is definite advantage in the real system considering all observing positions. If the source moves to the right, the arrival time disparity is aggravated; but since there appears to be a limit to the effect of arrival time, this negative effect is smaller than the positive advantage for movement to the left, and an overall gain results.

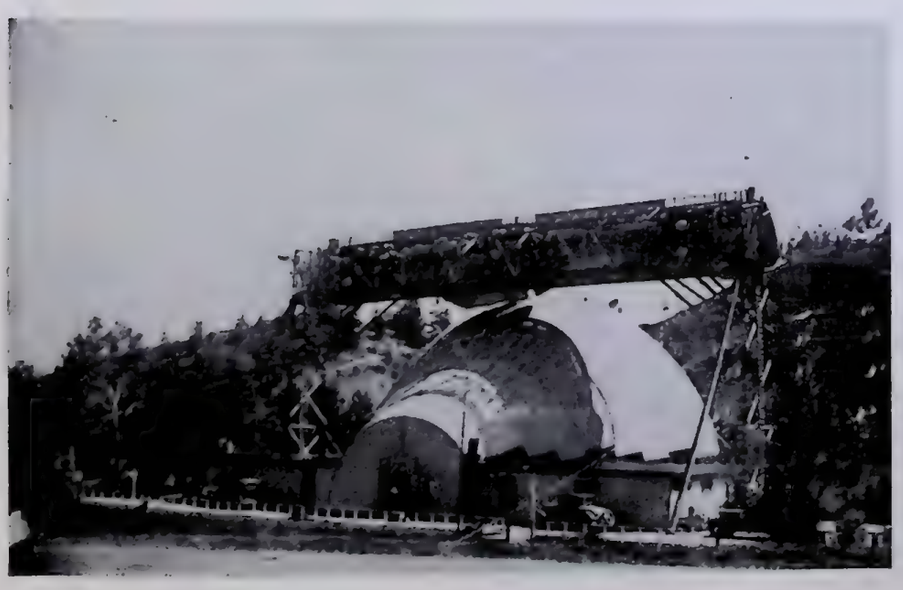


ONE OF THE low-frequency loudspeakers on the elevated platform. The loudspeaker was 10 feet high and 12 feet across the mouth of the horn.

If the observer turns his head to follow movement of the virtual source, the effect is to oppose the movement, since the ear on the side of the head in the direction of movement in effect turns away from the loudspeaker of increasing intensity, and the opposite ear turns toward the loudspeaker of decreasing intensity. Since the sound tends to move "too fast" toward the microphone being approached because of the combined effects of intensity and arrival time, this is an advantageous compensating factor, considering all seats in the auditorium.

APPLICATION OF BASIC PRINCIPLES

The practical art of applying stereophonic reproduction for public use is now building up rapidly. This paper is concerned primarily with the underlying principles, but it seems useful to



VIEW OF the temporary platform erected to carry the loudspeakers. It was 110 feet long and 45 feet high, and was used in 1936 demonstration.



THIS RARE photo shows the electrical equipment used in 1939 Academy of Music demonstration.

give some illustrative examples of how they are used. These examples are primarily of situations with which the author has personal experience.

Number of Channels

The number of channels will depend upon the size of the stage and listening rooms, and the precision in localization desired. Two channels give a large measure of the spacious effect desired for stereophonic reproduction, and will give fairly accurate localization for a small stage. Such a system on an ordinary-sized stage will give quite different localization impressions to observers in different parts of the auditorium, and is apt to suffer from the "hole-in-the-center" effect where all sounds at center stage seem to recede toward the back. Nevertheless, for a use such as rendition of music in the home, where economy is required and accurate placement of sources is not of great importance if the feeling of separation of sources is preserved, two-channel reproduction is of real importance.

That this is true is borne out by the current sponsored programs being broadcast by radio stations in various parts of the country using the FM transmitter for one channel and the AM transmitter for the other. Experience with this service in the writer's home has demonstrated the great increase in enjoyment it provides. Various methods for utilizing a single carrier for this type of broadcasting have been proposed, using upper and lower sidebands separately, simultaneous AM and FM modulation, and modulating one channel on a sub-carrier which is then modulated with the other channel on a regular FM transmitter. For such service the idea of supplying only one low-frequency loudspeaker appears important. It is well to recognize that a poor crosstalk ratio between channels in such a stereophonic system is not serious, because the relative intensity levels in the two channels never become greatly different. Thus systems which could not be considered for separate programs may be usable for stereophonic reproduction.

Three channels appear to be a good economic choice for ordinary stages and auditoriums. Good accuracy of localization can be achieved for favorable observing position, with reasonable results at other seating locations. The center channel is a great aid for solo and close-up work, as well as removing the "hole-in-the-center" effect mentioned before. For unusually wide stages, additional channels have been found necessary. At present it may be taken as a rule of thumb that additional channels should be considered when stage dimensions require channels spaced more than 25 feet on centers.

Loudspeakers

Placement—Loudspeaker placement is straightforward if considered for sound alone. The outside loudspeakers are placed at the outside edges of the space considered the reproducing stage, since sound cannot be made to travel past the outside speakers. The center, or other loudspeakers are placed at uniform spacing across the stage. It was stated that the close microphone position ordinarily used makes it possible to enhance depth effects. The source can therefore be made to appear in front of the loudspeakers, and they may be placed a few feet back of the front of the stage. In the Bell System demonstration at Carnegie Hall in 1940, the outside loudspeakers were spaced 40 feet on centers, and the front of each loudspeaker was 11 feet back of the decorative sound transparent front curtain. This curtain was illuminated in various simple color patterns during the performance an artifice which adds enjoyment when no picture accompanies the sound.

For sound-picture reproduction, the effect of the picture is great, and the precision of localization required is smaller. If the sound tends to be in the region of the visible source, it will be localized there. Consequently, here it is possible to create the illusion of sound outside the farthest loudspeaker.

When the stereophonic system is used for sound reinforcement, serious difficulty may be experienced in placing the loudspeakers where they will not obstruct the view. Fortunately here, also, the source is visible. In addition, it was shown that localization in the vertical plane is poor. The loudspeakers can therefore be placed above or below the stage level without loss of illusion, provided high fidelity of repdoduction is maintained. It is also sometimes possible to use a smaller loudspeaker in the center positions, without full low-frequency response, to give proper localization. One of the most successful stereophonic reinforcement systems was tested in the Hollywood Bowl in 1936, where the loudspeakers were mounted on a platform 45 feet above the stage level. The system supplied almost uniform sound throughout the seating area, and considerable amplification even for the closest seats. Nevertheless, the illusion that the sound came directly from the orchestra in the shell was excellent. To preserve a good illusion the loudspeakers should have approximately the same spacing as the channel microphones.

Characteristics—Since the illusion is caused by the receipt of multiple sound pulses, and in view of the observer-position effects discussed before, it is important that the loudspeakers give uniform angular coverage of the whole seating area. Actually greater energy should be supplied to seats at the side than to those in front of a loudspeaker, the inverse of the ordinary loudspeaker directional characteristic. Some toeing-in of the outside loudspeakers will help the average situation. In addition to these factors, de Boer also recommends minimizing sound projection to areas outside the audience to reduce wall reflections, and maintaining the quality of the several channels above 300 cycles as alike as possible. Quality differences will be interpreted in the stereophonic illusion as differences in direction.



LEOPOLD STOKOWSKI and the author, right, operating controls at 1939 recording session.

Bridged Loudspeakers — It is possible to bridge a center loudspeaker across the outside channels, which has the effect of reducing the apparent stage width. This would be useful if it were impossible to place the side loudspeakers as close together as desired. It would be subject to limitations of bridged systems already pointed out.

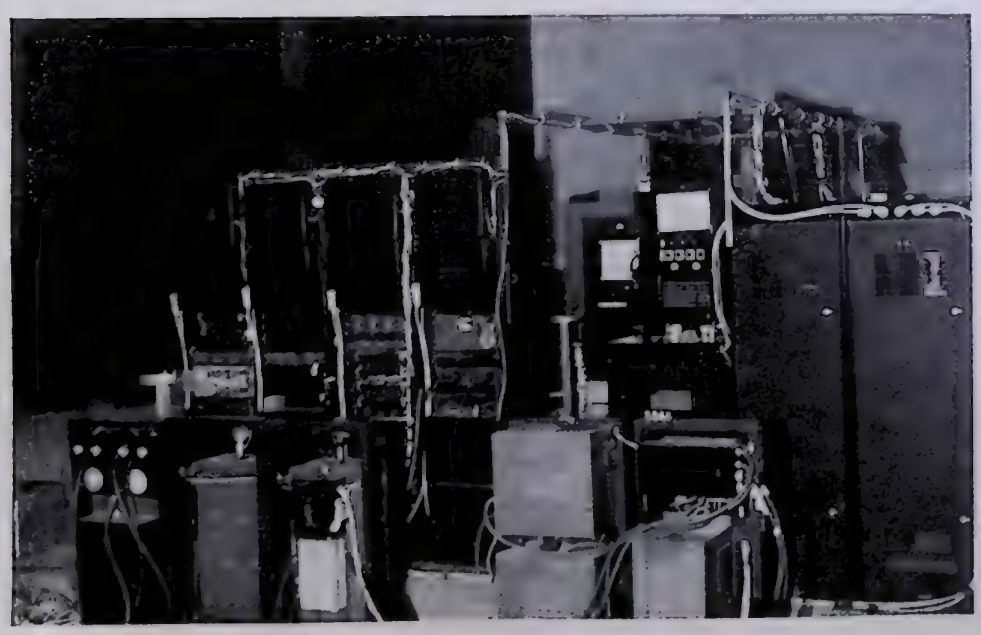
Microphones

Placement — Microphone placement may be simple or complicated depending on the application. From what has been said, it will be evident that creating the stereophonic illusion is a compromise between favorable and unfavorable factors, and microphone placement and movement can be used to advantage in effecting this compromise. Since the illusion depends upon differences in intensity and arrival time at the microphones, and change in ratio of reverberant to direct sound, the microphones must be placed close enough to the sources to create these differences. This means that each microphone "covers" only part of the stage and will be closer than fixed microphones placed for a single pickup. If pickup of action is necessary in a room where ordinary reverberation times obtain, the necessity of close pickup is apt to accentuate depth effect, and require a small stage area. Then dimensions are multiplied if a larger reproducing stage is used, and the speed of movement on the pickup stage must be slowed by an appropriate factor. Conversely, if the action demands a large stage, special microphone - handling techniques, such as those described by Grignon, will probably be necessary. A good combination is a dead stage in which a set of the size that will accommodate the action can be constructed with the proper combination of flats to give a reflected sound content that will produce the desired depth illusion.

The motion picture industry is rapidly developing the art of microphone movement for stereophonic recording where action and movement of camera are all-important. For other stereophonic pickup, such as music, radio plays or sound reinforcement, fixed microphone positions aided by some mixed-in special pickups will usually suffice. The regular microphones are deployed in front of the stage. If all action is at front stage, the outside microphones should be at the outside edges. However, to secure the illusion of action on a rectangular stage requires a greater stage width at the rear line than at the front, and some compromise must be made; so the side microphones are usually placed somewhat inside the edges. This is particularly true of a two-channel system where a compromise between "hole-in-the-center" sound and well spread sound must be effected. In this connection, a bridge center microphone is frequently used and does fill up the hole for center observing positions, However, it obtains this effect by adding sound to the side channels at advanced arrival time, thus aggravating the shift of the virtual source as the observer moves to the side of the auditorium.

After considerable experimentation the microphones for the Philadelphia Orchestra recordings demonstrated by the Bell System in 1940, were suspended 10 feet above the stage and five feet inside the front row of musicians. The orchestra width was about 40 feet and the outside microphones were 28 feet apart. For small stages with actors, good results were obtained with a 12 foot square stage in a very dead room using two microphones nine feet apart and five feet from the front of the stage. In a rather reverberant medium-sized room a stage 15 feet wide and six feet deep, using three channels, with the microphones on six foot centers and four feet from the front line, proved satisfactory. In this case, note the shallow depth dictated by the reverberation in the room.

Directivity—Directive microphones can frequently be used to advantage. Since to produce an angular illusion it is necessary to generate intensity differences in the channels, a study of the geometry will show that greater movement is required at the rear of the pickup stage than at the front to produce a given angular impression. If the microphones are directive, greater intensity changes will occur as a source



POWER EQUIPMENT on stage of Pantages Theatre, Hollywood, during demonstration June, 1940.

moves across the stage from the lobe of one microphone into that of another, and the rear line will be shortened. At the front line the directivity effect may be so great that the sound appears to recede between microphones. Experiment has shown that with moderate directivity, and by toeing in the lobes of the side microphones somewhat, an advantageous compromise between these two effects can be made and better overall coverage of a rectangular stage obtained.

This effect may be obtained with microphones of uniform directive properties, such as the cardioid types, or with the directivity only at high frequencies characteristic of a relatively large condenser or dynamic microphone at normal incidence. The latter will give accentuated directional effects with less change in overall loudness. Here directional effects are really quality changes. While in monophonic reproduction these quality changes would be objectionable, in stereophonic work the listener's fused impression consists of the contribution from several sources and the source is always in the direct lobe of one microphone. If the normal incidence characteristic of the microphone is considered in overall system performance, the fidelity will remain high from all source positions.

The elimination of the pickup from behind the microphones is a definite advantage in most cases. Obviously it eliminates noise. But it also eliminates part of the reverberation, and since most stages have more than the desired reverberation ratio for the physical depth, this is an advantage.

Bridged Microphones

Since channels are expensive and the complications grow with greater numbers, it is tempting to use bridged microphones to simplify the system. If this technique is used with restraint to gain additional realism in reproduction, it can be extremely useful. If it is used in the hope that it will be a cheap way of duplicating the performance of a more elaborate system, the results are bound to be disappointing.

An example of a useful application of the bridged microphone is its use to emphasize a small group of instruments in orchestra, when the overall pickup is satisfactory in other respects. This was employed in the Hollywood Bowl demonstration where one extra microphone was used continuously on the right channel, and others were employed during special parts of the performance. In monophonic systems, multiple microphone pickup often leads to poor fidelity because of cancellation between the signals from the microphones in specific frequency regions. In stereophonic systems this effect is ameliorated because sound is fused from several sources.

Amplifiers

Amplifiers for use in stereophonic systems do not differ from those of monophonic systems except in number. The characteristics of the amplifiers in the various channels should be similar, and the gain should be stable so that no undesired level differences will occur. It is usually found desirable to have a ganged volume control which will adjust the overall level, and as individual control in each channel for balance or intentional unbalance settings. Similar provisions for quality-changing networks are desirable. If bridging systems are to be used proper networks and bridging amplifiers must be provided to insure that signals flow only in the desired directions, and inadvertent gain changes are not made during switching. It is also good practice to observe a poling convention throughout all channels, including the microphones and loudspeakers, although the channels spacings are so be considered at other than random wide that only very low frequencies can phases in one channel compared to another.

As a matter of economics, it is probably true that the added complication of stereophonic reproduction will be employed only for high fidelity reproduction. Consequently, the amplifier systems will require the same care that is required to secure high fidelity in monophonic systems.

PSEUDO-STEREOPHONIC RECORDING

Following presentation of the paper in New York, the author addressed the SMPTE in Hollywood and added a fuller discussion of the use of the pseudo-stereophonic or bridged-microphone system. Since this is a very active subject at present and affects the pictures being made, it is of importance to exhibitors.

It is tempting to use manually controlled methods in pickup to create the stereophonic illusion because of many practical complexities in multi-channel microphone technique, and differences from the standard monophonic techniques developed during years of sound recording in motion picture production. This takes the form of using a single microphone recording and controlling the relative recorded amplitudes in the stereophonic release tracks by means of a ganged mixer or "pan-pot" during dubbing. However, when a source moves on a stage where multiple pickup is employed, three other factors vary in addition to intensity. This is illustrated where the source, as shown at A, moves from left to right in a straight line. The curves at B illustrate the changes of intensity I_{Rt}, ratio of reverberant to direct sound intensity R/D, arrival time T, and sound quality Q which occur at the right microphone. (Effects on the center microphone are omitted to reduce complication in the curves.) It will be seen that the intensity rise 12.5 db. Reverberant energy remains constant at the microphone; consequently the ratio of reverberant to direct intensity goes through a decline of 12.5 db. The arrival time decreases by 11 milliseconds as the source comes nearer. And finally, the quality changes when a microphone not absolutely uniform in directivity vs. frequency is used. In this illustration an extreme case of a three-inch diameter dynamic microphone is used for emphasis, and the curves show that there is much more relative high frequency when the source is near the microphone.

While it is true that the stereophonic effect is an illusion, experience has shown the illusion is enhanced when all of these factors are varied properly and simultaneously by movement, compared to manual variation of a single element. It is known to be possible to produce

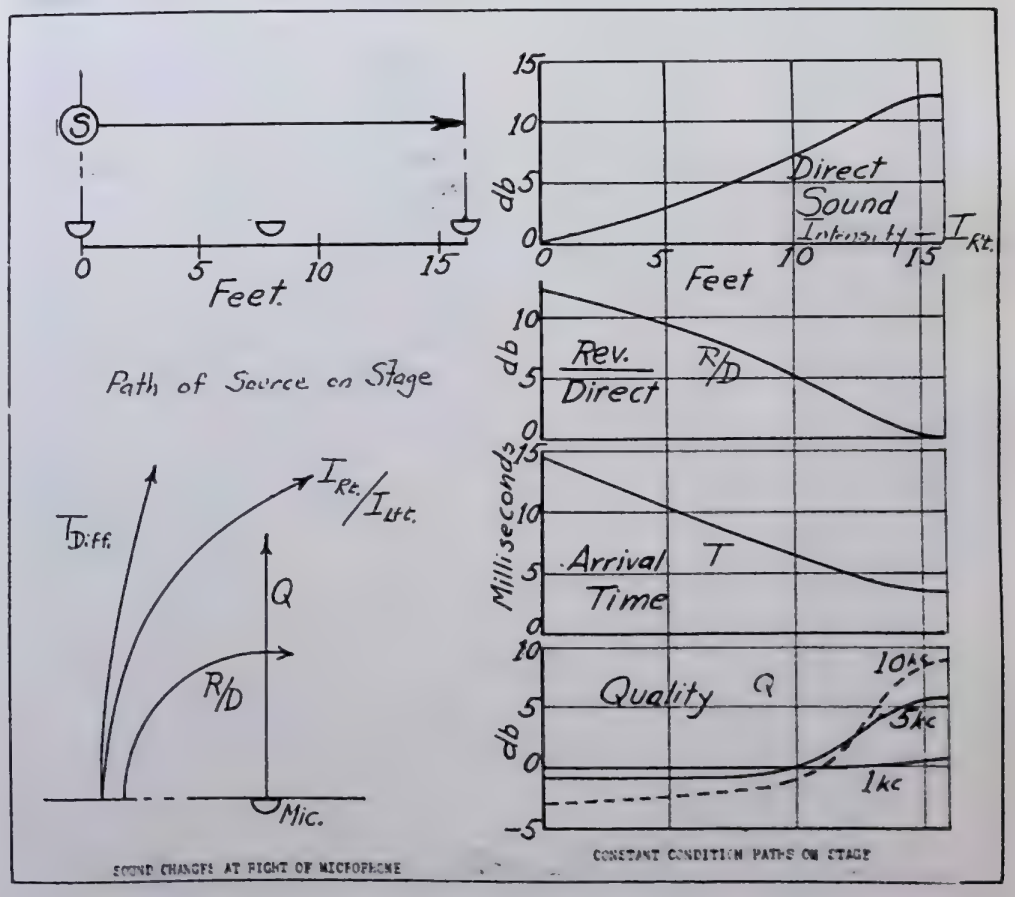


FIGURE 4 is a chart showing that when a source moves on a stage where multiple pickup is used, three factors vary, plus the intensity.

all of these variations electrically with sufficiently complex equipment, but it must be realized that the curves shown represent only one movement path. For example, at C are shown four possible paths. One maintains constant arrival time difference T_{Dif}; one constant intensity ratio $\frac{I_{Rt.}}{I_{Lft.}}$; one constant reverberant to direct sound ratio R/D; and one constant quality Q. In each case the other three factors vary in a different way and different from the curves of B. Thus it will require considerable skill and judgment from the mixer. When conditions can be arranged for stereophonic pickup the relationships take care of themselves.

The pseudo-stereophonic effect is limited to non-simultaneous single sources, because all sounds recorded by the single microphone will be localized at the same place for any one setting of the controls. Thus an individual set of controls and an individual recording is required for each sound which must overlap another. A multiple channel stereophonic system is necessary to record a spread source such as an orchestra, restaurant scene, a chase, or a battle, if positional illusion is to be obtained. However, on such a background, dialogue or sound effects can be effectively superimposed by manual control.

In the writer's opinion the pseudo-stereophonic techniques will serve an important and continuing auxiliary function in picture production, but will not be found an acceptable substitute for stereophonic pickup.

Theatre Problems

From the standpoint of the exhibitor's view of stereophonic sound, there appear to be two items of particular interest. The first concerns more adequate coverage of the whole audience area. This is discussed in the paper under "Effect of Observer Shift." Even if a studio does a superlative job of stereophony for the central seats, the illusion will be less satisfying, or even unsatisfactory, for side seats. Something can be done about this by proper pickup methods which the studios are learning, but it should also be attacked from the theatre standpoint. Suggested remedies are discussed briefly under "Methods of Reducing Shift," but apparently very little fundamental investigation in this field has been carried out. This is probably because the studios have been engrossed in their pressing production problems since stereophonic sound became of commercial value. Considering its serious import to theatre owners, it appears that they should actively support the start of a program to study this effect as soon as possible. It seems probable that much improvement may be expected over present coverage when new techniques are developed.

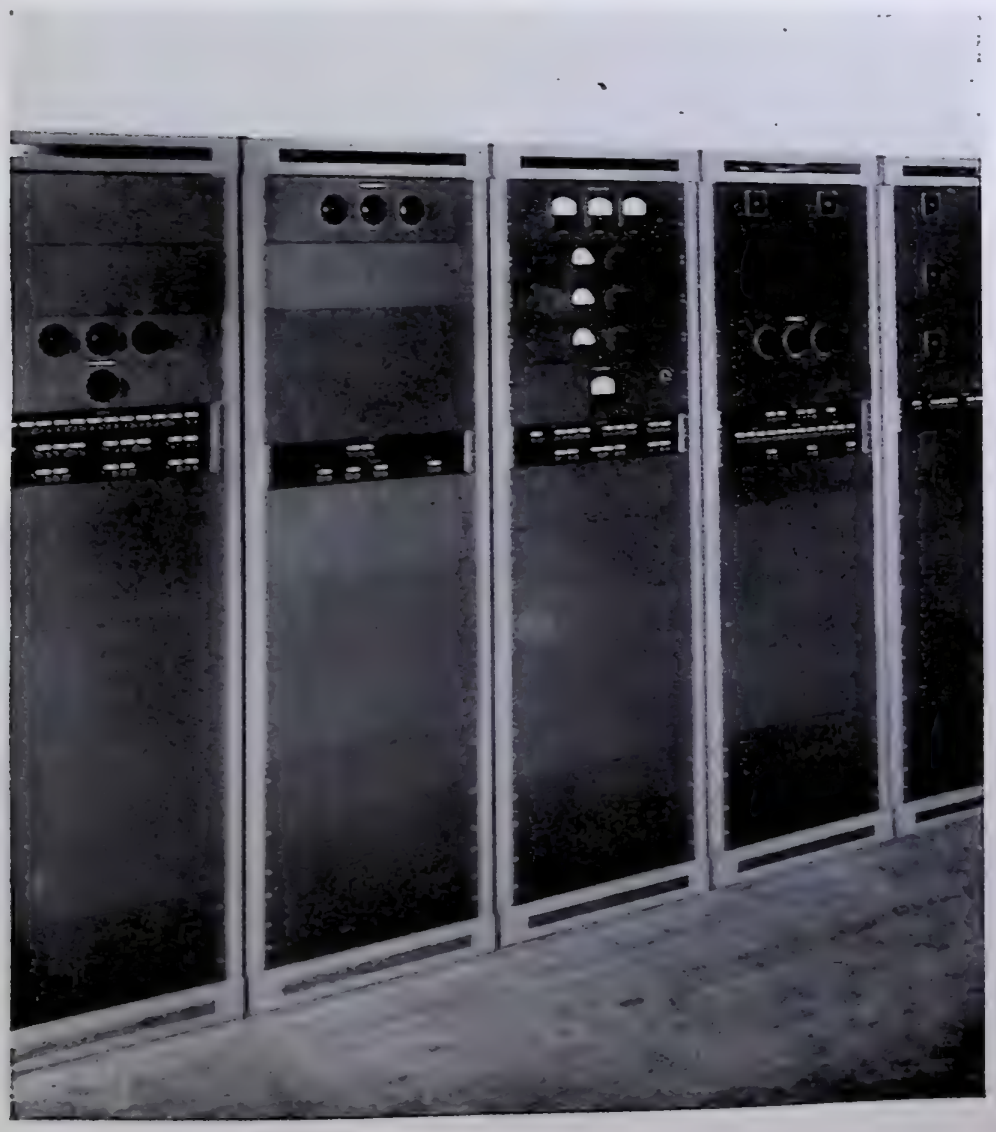
The second subject concerns the various systems for switching or controlling loudspeaker output from a single sound track on the film, which are being installed in theatres in place of true stereophonic systems. These are used both to save expense and to obviate present technical difficulties of multi-track release prints. The writer feels that, as in the past, the technical difficulties are transitory and will be eliminated in the course of a reasonable time. Presumably the exhibitor feels that sound movement is valuable in his theatre, or nothing in addition to the monophonic system would be installed. The use of such systems, therefore, depends upon economic judgment and any possible advangtages from a fundamental standpoint.

These systems, from the functional standpoint, are just pseudo-stereophonic systems with the pan-pot moved into the theatre and operated by a robot dubbing mixer. The simplification results from the fact that a robot moves relatively slowly, and a very elementary channel, compared to a sound track, will satisfy his needs. A switched or controlled system actually has 4 channels — the high fidelity sound track, plus 3 channels of information which must be separated to tell the robot which loudspeaker to connect, or how to adjust the relative amplifier gains.

These systems can therefore be expected to do what the purely pan-pot technique in dubbing can do. If only one loudspeaker is turned on at one time, as in a switched system, sound will definitely be localized at that position, but the only possible positions are those of the loudspeakers. If relative levels are adjusted by sub- or super-audible pilot tones, intermediate positions are possible, subject to the limitations described above for pan-pot technique.

It is imperative to remember that, since there is only one sound track, all sounds will come from the same direction. Thus background music or crowd noise will shift position as dialog or sound effects shift. If one moves, the other must, and as an actor walks across the stage the orchestra goes with him. No stereophonic quality of spaciousness can be preserved; to spread out an orchestra requires true stereophonic reproduction. Some benefit in musical reproduction seems to be obtained from connecting multiple loudspeakers with different relative bass and treble response to a single channel, as long as conditions remain constant. However, with a single sound track, dialogue and music are inseparable, and either everything moves, or they are left stationary, in which case a control system is not needed. It is not possible, as in the studio, to combine the controlled dialog with a spread orchestra because of the single sound track. It thus appears that the switched or controlled system has no functional advantages over the stereophonic system, and must be justified only by its economy.

THIS IS a photograph showing the redesigned system for the ERPI in 1941. It was used in many experiments and demonstrations by the ERPI, and is a symbol of the progress made in stereophonic sound.



Perspecta Stereophonic Sound

Study of the Basic Principles and the Equipment Required to Obtain Stereophonic Sound From a Single Optical Track

By CHARLES J. BACHMAN
Theatre Equipment Products Mgr.
Fairchild Recording Equipment Co.

BRIEF: *Many exhibitors . . . because of financial . . . physical . . . or personal reasons . . . did not install magnetic stereophonic sound in their theatres . . . The fact that this new method of sound presentation was an "extra" which helped bring in customers . . . however . . . made directional sound a valuable asset . . . A solution to this problem appears to be offered by the Perspecta stereophonic sound system . . . which makes it possible to obtain directional sound from a single optical track . . . using standard projection equipment and procedures.*

This article . . . prepared by one of the men responsible for the development of the equipment needed . . . is an attempt to clear up some of the confusion found concerning such things as how the system works . . . what is needed . . . the theory . . . and also information on installation . . . and maintenance.

Stereophonic sound can now be recorded on and reproduced from a single optical track of any existing variety. In fact, during the past several months, hundreds of theatres have been equipped to show film with stereophonic sound recorded by this method. This accomplishment, Perspecta Stereophonic Sound, is the result of an idea conceived by C. Robert Fine and the development of the practical equipment by Fairchild Recording Equipment Company, under the direction of Ray F. Crews. The system was quickly accepted by the motion picture industry's major producers as the standard for stereophonic sound.

Standard Equipment Used

The basic intent of the development was to provide stereophonic sound on standard film without modification of the film nor modification of the projector in which it is used. This means that all film productions made by the Perspecta method can be played on all existing optical sound reproducing systems with no changes whatsoever. If the theatre is not equipped for directional sound, no consideration need be given to the use of the film. However, if stereophonic reproduction *is* desired, and the theatre has magnetic-type sound-reproducing equipment, the only additional equipment, required is an "integrator." In those houses in which stereophonic equipment has not been installed, it is necessary, of course, to add three power amplifiers and three horn systems.

How Perspecta Works

In the actual reproduction of stereophonic sound, the audience is conscious primarily of the difference in sound intensity from different directions. For example, when a voice originates near the left side of the screen, it is identified as coming from the left only because it is louder from the left speaker than sound emanating from the center and right speakers. The Perspecta sound method of recording is particularly adaptable to accentuation of the volume difference effect between speakers. As a result, the most startling and spectacular effects can be realized.

To understand the basic concept of Perspecta sound, one must first remember that standard theatre sound equipment reproduces sound audible to the audience between approximately 70 and 8,000 cycles. The heart of the Perspecta sound system, then, is a specially-designed unit called an integrator, which accepts all sound on the optical track and then does two things: first, it separates the whole recording into two sections, one being the true audio of the program material from 63 cycles upward, and the other being control frequencies which are below 63 cycles.

The control frequencies are then separated by band-pass filters, with the result that a separate control voltage is supplied to each of the individual circuits feeding the three theatre channels. Thus, these control frequencies present on the Perspecta sound track accurately govern the distribution of sound to the three theatre horn systems. To be specific, let's assume that the action and sound on the left side of the stage is to be accentuated. The studio mixer raises the volume of the 30-cycle control signal being recorded and reduces the volume of the 35- and 40-cycle carriers by the desired amounts. As the action and sound





A FRONT (left) and rear (right) view of the power supply and integrator unit necessary in order to obtain the optical stereophonic sound.

move to the center of the stage, the volume of the 35-cycle carrier is raised and the 30-cycle (left) and 40-cycle (right) carrier signals are reduced. Of course, any combination of levels can be obtained to give the impression the sound is coming from any intermediate location on the screen. It also is possible to raise all carriers to full output at the same time.

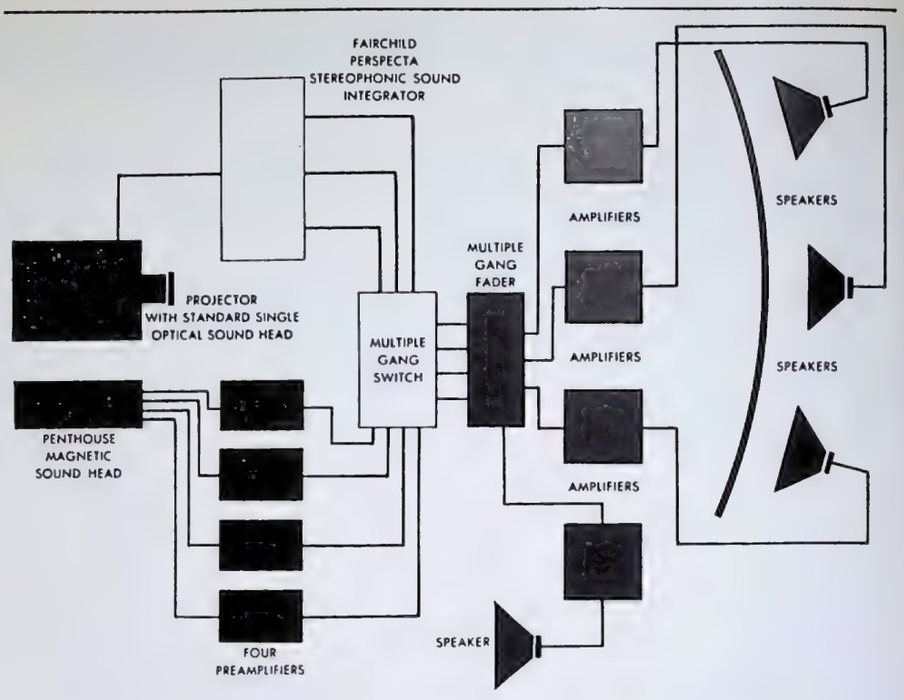
In practice, the recording is made in the conventional manner and volume variation is accomplished by including the three low-level, low-frequency carrier signals on the same track with the speech and music. When played through a standard, single-channel optical sound system, these carrier tones are inaudible. Because of this, the Perspecta release print will play as single sound in any theatre in the world. However, the same Perspecta release print will produce the finest stereophonic sound in a theatre equipped with the Fairchild Perspecta Integrator and multiple speakers and amplifiers.

Installation Considerations

To install the integrator, it is necessary only to connect the output of the projectors to the input of the integrator at a point past the changeover position. Only one integrator is used in a projection booth. A selection of input impedances is available so that low-impedance (500 ohm) and high-impedance sound head outputs are accommodated by a preamplifier with a wide range of gain. The output impedance of the three channels is 600 ohms for connection to the input of the three theatre power amplifiers. A three-gang, 600-ohm, 20-step volume control is then inserted at the output of the integrator to control the auditorium sound level.

No changes whatsoever are made to the projectors. The film carries normal-sized sprocket holes, thus requiring no special splicing machine. This film is not subject to the hazards of magnetic-type recording, as it is not affected by heavy AC fields nor subject to easy abrasion. Hum troubles are at a minimum because the system operates with lower gain than the magnetic-type recording.

Another feature noticeable to the listener is the quietness of the no-signal sections of the picture being presented. In Perspecta sound recording there is only one track to contend with so far as signal-to-noise ratio is concerned, whereas in multitrack systems all channels are open, whether carrying sound or not. With the Perspecta Integrator in operation each channel is closed except during the actual transmission of sound.



THIS DIAGRAM illustrates what a theatre operator must do to install Perspecta stereophonic sound if the theatre is already equipped for a magnetic track system. The only equipment needed is one integrator unit and a transfer switch. The black symbols seen represent existing equipment.

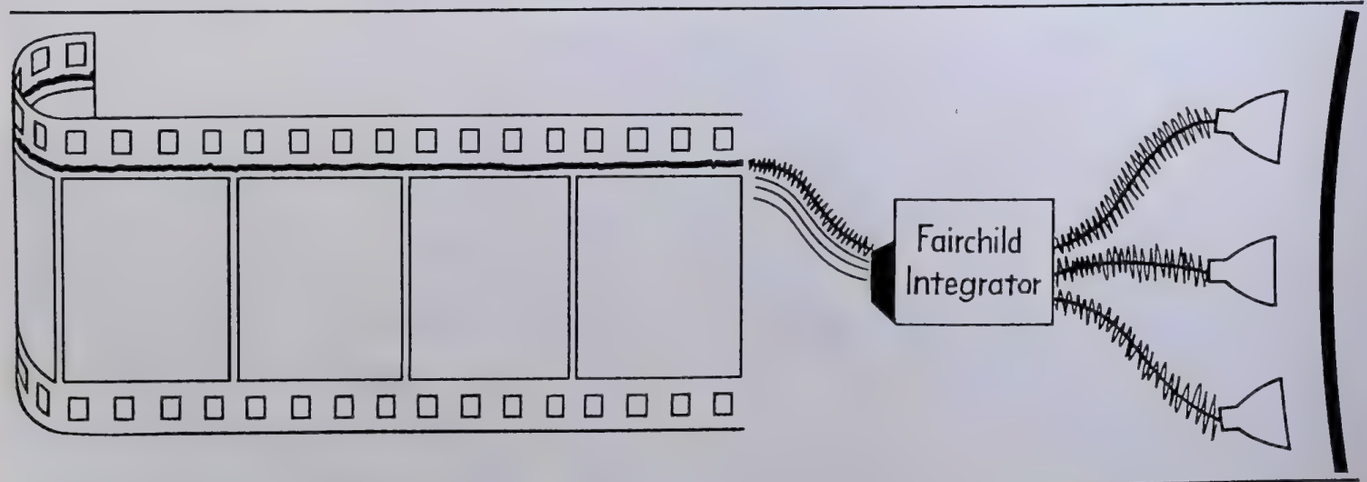
From Projectionist's Standpoint

Perspecta sound presents no novel procedures to learn. The same film is used as in the past; the same method of threading, and the same old splicer familiar to all projectionists. The motor-operated, enclosed rewinder may be used as usual, and the film can be located without harm near motors or rectifiers.

With the integrator, it is possible to run not only stereophonic prints but also conventional optical non-stereophonic prints without even throwing a switch. This ease of operation is accomplished by an automatic switching arrangement built into the integrator. When a single-optical-track film is being run, this switch moves to the "mono-sound" position and the sound comes out through center horns only. When a Perspecta-sound-track film is being run, the switch moves automatically to the "Perspecta sound" position and the sound enters each horn as originally planned by the sound recording studio.

Maintenance of the unit is quite elementary, as the equipment has been thoroughly designed following conventional practices. The unit has good accessibility for maintenance purposes.

Compatibility with existing equipment and method is an outstanding advantage of Perspecta Stereophonic Sound system. Comparative simplicity of the integrator and the entire system keeps installation and maintenance costs low.



THIS is Perspecta stereophonic film. The three low-frequency tones which govern the sound have been recorded on same track with other sounds.

Carbons for the New Systems*

An Analysis of the New Systems' Demand for More Projection Light, and Some of the Carbons Developed to Meet This Need

By F. P. Holloway, R. M. Bushong and W. W. Lozier

National Carbon Company
A Division of Union Carbide and Carbon Corp.

BRIEF: ***With the development and introduction of such things as 3-D . . . and the various wide screen processes . . . in addition to the large number of outdoor theatres . . . there has been a steady demand for more projection light.***

This article discusses some of these new systems . . . and how carbons presently available . . . or now under development . . . will answer the exhibitor's need for a brighter picture on a larger screen area . . . In addition to the material on carbons . . . there is also much of value and interest about the basic problems involved in the presentation of some of the newer projection techniques.

The attention of theatre owners and projectionists, is now focused on the need for more projection light created by recent developments in the motion picture field—wide screen, 3-D, and outdoor theatres. In some instances projection light requirements have been greatly altered compared with conventional projection, necessitating a complete reappraisal of carbon arc light sources and lamp equipment.

A complete summary of the amount of screen illumination obtainable with the popular combinations of lamps, optical systems used for 35mm motion picture projection was published in 1947.† The years since have been important new developments in all aspects of motion picture projection systems. Hitex* 13.6mm, super high-intensity carbons were introduced in 1949 for use in rotating-carbon, condenser-type lamps at 170-180 amperes.

Recent months have witnessed the introduction of a new 13.6mm standard high-intensity carbon to replace the former one used in condenser-type lamps at 125-150 amperes. A new Suprex* 9mm positive carbon has extended the range and output of the non-rotating carbon, reflector-type lamp used with copper-coated, non-rotating carbons. A new Suprex 7mm positive has made possible increases in efficiency and light output compared with Suprex 7mm carbons formerly used. New high-speed, reflector-type lamps employing rotating 9 and 10mm positive carbons have been marketed and are finding wide usage.

New Powerful Carbons

In addition to these combinations already in commercial usage, National Carbon Co. has developed several new carbons specifically to meet the demands of the new projection systems. These include the new Hitex 9 and 10mm carbons for rotating-type reflector lamps; and the new Ultrex* 10, 11, and 13.6mm carbons which are most effective when used with adequate water cooling in rotating-reflector as well as condenser-type lamps. While these new carbons have not been placed on the market as yet, they will be available whenever suitable lamps are announced.

Figure 1 shows maximum screen lumens at different arc currents for various lamp and carbon combinations with not film, shutter or filters. Values of screen lumens obtained with the lamps and optical systems adjusted to produce 80 per cent side-to-center distribution ratio are not shown, but they generally fall 10 to 25 per cent below the maximum values. Figure 1 shows that the rotating-type reflector and condenser lamps are capable of projecting more than 20,000 lumens with *standard* carbons, and more than 30,000 lumens with suitable *experimental* carbons.

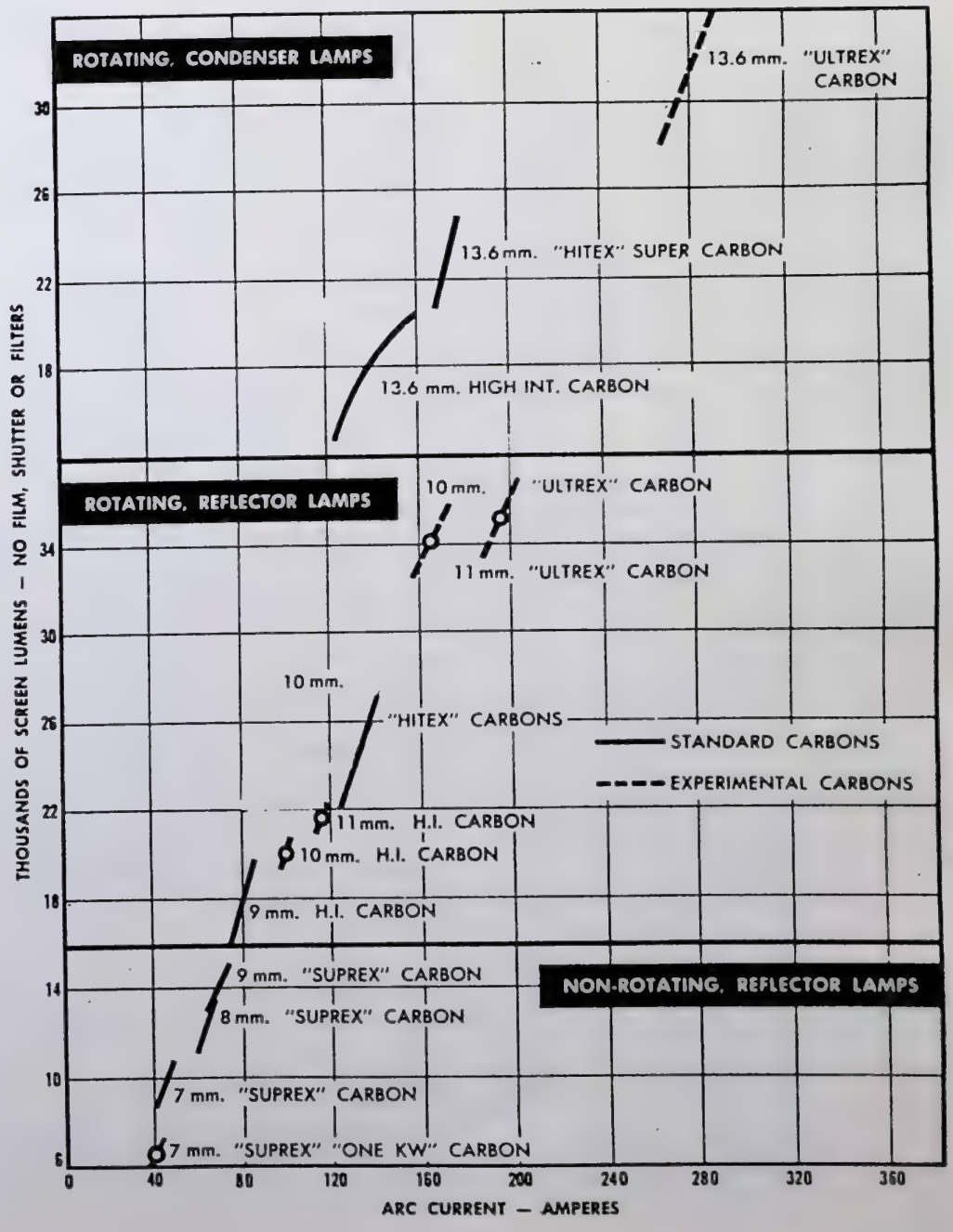


FIGURE 1 shows maximum screen lumens at arc currents for various lamp carbon combinations.

*This article originally appeared in the International Projectionist and is reprinted here by special permission of the editor.

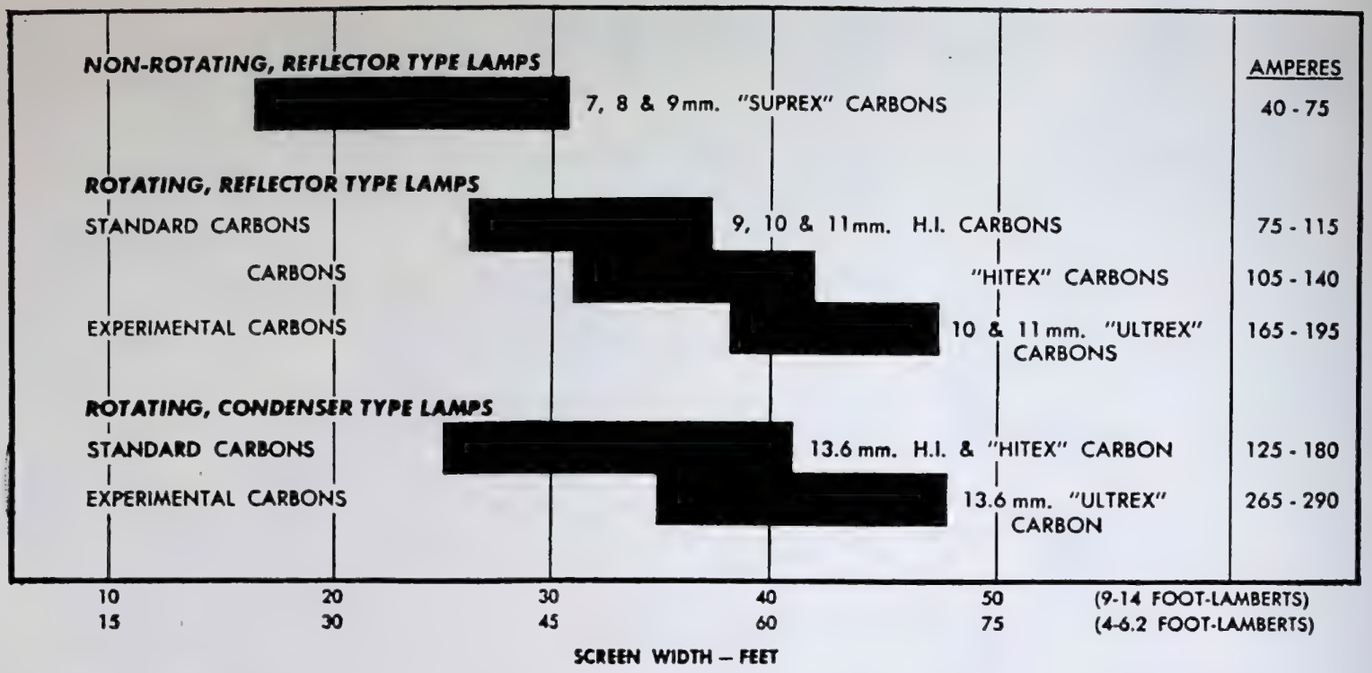


FIGURE 2 shows the size of the screen capable of illumination to indicated screen brightness at the center of the motion picture screen.

Possible Protective Means

In some cases, these lamps can project more light and heat onto the film than can be accommodated without some suitable cooling means. This article does not specify means of protecting the film from high levels of radiant energy flux; it points out, however, that the use of infra-red absorbing filters, infra-red reflecting filters, controlled air-blast and the use of a water-cooled film gate have all been asserted to provide some protection to the film. Such protective means may require the sacrifice of a small portion of the screen light and will correspondingly change the lumen values of Figure 1.

The light requirements of the new projection systems may be analyzed in correlation with these latest developments, beginning with a restatement of the American Standards Association indoor theatre standards, which recommends a screen brightness of 9 to 14 foot-lamberts with the projector running and no film in the gate.

Screen Widths, Light

The data of Figure 1 have been used to calculate the widths of screens which can be illuminated to the aforementioned ASA standards, with a projection shutter of 50 per cent transmission, a projection room port glass of 90 per cent transmission, and a projection screen of 75 per cent reflection factor.

The resultant screen widths are shown in Figure 2. The lower ends of the screen width ranges shown in Figure 2 belong to the smaller and lower power carbon trims and to the *maximum* recommended screen brightness; while the larger screen widths pertain to the larger and higher power combinations and to the *minimum* recommended screen brightness.

No allowance has been made for light losses that may occur with heat filters which may be needed under some conditions to prevent heat-on-film troubles. The data of Figure 2 will need to be correspondingly altered in case there are any additional light losses beyond those assumed. For example, a 10 per cent loss in light will reduce the indicated screen widths about five per cent.

Outdoor Theatres Pose Problem

Reference to Figure 2 shows that Suprex carbon trims are capable of illuminating screens approximately 16 to 30 feet wide at maximum light. Rotating-type reflector lamps increase these screen widths to 23 to 33, and 26 to 37 feet with standard carbons. Generally speaking, the rotating-type condenser lamps are capable of illuminating about the same width screens as the rotating-type reflector lamps.

The foregoing discussion shows the present difficulty of lighting screens of 50 to 70 feet width, common in outdoor theatres, to the standard of 9 to 14 foot-lamberts applicable to indoor theatres. However, the screen brightness requirements of outdoor theatres are not as precisely known as are those for indoor theatres, because of the widely variable physical conditions. Just what level of screen illumination can be obtained on these large screens depends upon the maximum amount of light obtained from the projection system.

Increasing the indicated screen widths by 50 per cent, *without changing the present standard ratio of height to width*, corresponds to a screen area 2 25 times greater. Such a screen can be illuminated by the combinations of Figure 1 to a center brightness of 4 to 6.2 foot-lamberts. These screen brightness limits have been chosen *not* because of their ultimate desirability but rather because they are in the range being obtained by some outdoor theatres. The rotating-type reflector lamps and the rotating-type condenser lamps can illuminate screens of 45 to 70 feet width to a screen brightness of four to six foot-lamberts.

Wide-Picture Requirements

Although the data contained in the tables are limited to projection from a *standard* 35-mm motion picture film aperture of 0.600 inches by 0.825 inches and thus are not directly applicable to other film aperture sizes and picture aspect ratios, rough estimates can be made in some instances. For example, the outputs of the various 35mm film projection systems may be redistributed by optical means over various sizes and shapes of film apertures and projection screens. If this be accomplished with minor or known losses, the results expected can be closely approximated.

The requirements of CinemaScope, which employs a standard projection frame but a 2.66 to 1 picture aspect ratio, can be calculated once the information on the transmission and reflection of the added accessories employed is known.

Except for the optical losses in the added anamorphic lens which functions to produce a two-fold expansion of picture *width* during projection, this expansion would produce a two-fold increase in picture area and reduce by one-half the available screen brightness *obtainable with a normal unexpanded image*. Therefore, the light requirements for the same screen brightness would be double those of *conventional* 35mm pictures on the same type screen—that is, if the CinemaScope aspect ratio of 2.66 to 1 is to be observed.

Screen Reflectivity Level

If suitable directional-type screens of higher reflection factor, with adequate uniformity over the audience area, can be obtained, the lumen output required to illuminate a given size screen to a specified brightness can be reduced proportionately. In the case of Cinema-

Scope projection, if a directional screen can be obtained with *twice* the reflection factor of a normal matte screen, the two-fold increase in screen area produced by the anamorphic lens would be approximately compensated for and the existing screen brightness with the same projection lamp would be essentially the same.

Requirements of 3-D

The stereoscopic motion pictures of the type being shown in this country employ separate lamps, projectors and 35mm films for the projection of right- and left-eye pictures each polarized at right angles to the other; a metallic-type screen is used and polarizing viewers are worn by the audience. The light losses will depend upon the transmission factors of these various stereoscopic components, which vary with the particular design and with technical characteristics.

Typical transmission values must be discussed here, realizing that these may be altered by future design changes during the evolution of stereoscopic motion picture projection.

Present-day polarizing materials are reported to have a typical light transmission value of 40 per cent. The viewing spectacles, likewise, are reported to have a transmission of 80 per cent. At the present time the screen reflection factor of suitable metallic-type screens is more uncertain and subject to variation depending upon the particular type employed. A general characteristic of the metallic-type screen is an inverse relation between maximum screen reflection factor and uniformity of screen brightness over all angles of view in the theatre.

Directional Screens

Consequently, a compromise is chosen between high screen reflection factor with undesirable directional variation on the one hand, and lower screen reflection factor with better directional characteristics on the other. A reflection factor of 125 per cent is typical for a number of screens, meaning that the *reflected* screen brightness measured in foot-lamberts is 125 per cent times the light intensity in foot-candles *incident* on the screen.

The combination of this screen reflection factor with the transmission values of the polarizer and the viewer results in an overall light transmission of 40 per cent ($1.25 \times .40 \times .80 = 0.40$) compared with the 75 per cent reflection factor assumed for the matte screen used for conventional projection.

The stereoscopic projection components therefore reduce the final screen brightness to a value equal to 53 per cent (40 divided by $75 = 0.53$) of that with the same projection system with a matte screen without stereoscopic accessories. In other words, the screen brightness requirement is approximately double that for conventional 35-mm projection.

The fact that separate projectors are employed for the right- and left-eye pictures does not alter the basic facts of this analysis, for each projector is subjected to this approximately 50 per cent loss in brightness and contributes only to the brightness and picture observed by *one* eye, and the composite picture brightness visible to *both* eyes is still equal to that furnished by the individual projectors to *each* of the observer's eyes.

Should efforts to produce screens with higher reflection factor and with adequate uniformity of brightness over the theatre viewing angles be successful, then the final screen brightness figure will be increased with a corresponding decrease in the required amount of projection light.

CONCLUSION

The foregoing discussion emphasizes the need for more projection light. The revolutionary techniques are still new, and since it is not practical to develop and control everything all at once, immediate perfection cannot be expected. The new carbons which have been developed will produce considerably more screen light; their successful utilization, however, will require suitable lamps and other projection equipment.

For the present, however, acceptable levels of screen brightness for these new systems are within reach, provided the equipment necessary to operate the higher capacity carbons is installed; and provided the entire projection system, including lenses, mirrors, condensers, and port glasses, is in exact adjustment and in good clean optical condition.

†*"Screen Illumination With Carbon Arc Motion Picture Projection Systems," by R. J. Zaresky, C. J. Gertiser, and W. W. Lozier; Journal of SMPE, 48: 73-81, January, 1947.*

•*The terms "Hitex," "Ultrex" and "Suprex" are trade-marks of Union Carbide and Carbon Corp.*

CARBONS		Arc			80% dist.		Max. light[3]		Approx. carbon consump. rate, in./hr	
Positive Type	Negative Type	amp	volts	Lamp optical sys.	Screen lumens[1]	% dist.[2]	Screen lumens[1]	% dist.	Pos.	Neg.
Non-Rotating, Reflector-Type Lamps—"One Kilowatt" d-c Trim										
7-mm × 12 or 14 in. Suprex	6-mm × 9 in. Orotip C	40	27.5	11¾ in. dia *f*/2.5 mirror	5,900	80	6,500	65	5.8	3.4
Non-Rotating High-Intensity Trims										
7-mm × 12 or 14 in. New Suprex	6-mm × 9 in. Orotip C	42	36	14 in. dia *f*/2.3 mirror	7,250	80	8,650	60	7.6	3.8
7-mm × 12 or 14 in. New Suprex	6-mm × 9 in. Orotip C	46	38	14 in. dia *f*/2.3 mirror	8,150	80	10,000	60	9.3	4.0
7-mm × 12 or 14 in. New Suprex	6-mm × 9 in. Orotip C	50	40	14 in. dia *f*/2.3 mirror	9,200	80	11,700	60	11.6	4.3
8-mm × 12 or 14 in. Suprex	7-mm × 9 in. Orotip C	60	36	14 in. dia *f*/2.3 mirror	10,300	80	11,000	65	9.0	3.8
8-mm × 12 or 14 in. Suprex	7-mm × 9 in. Orotip C	65	38	14 in. dia *f*/2.3 mirror	11,800	80	12,700	65	11.8	4.0
8-mm × 12 or 14 in. Suprex	7-mm × 9 in. Orotip C	70	40	14 in. dia *f*/2.3 mirror	13,000	80	14,000	65	15.0	4.3
9-mm × 14 in. Suprex	8-mm × 9 in. Orotip C	65	41	14 in. dia *f*/2.3 mirror	12,300	80	13,000	70	10.5	3.3
9-mm × 14 in. Suprex	8-mm × 9 in. Orotip C	75	45	14 in. dia *f*/2.3 mirror	13,800	80	15,000	70	15.5	3.8
Rotating, Reflector-Type Lamps										
9-mm × 20 in. High-Intensity	5/16 × 9 in. Orotip	75	52	16–16½ in. dia *f*/1.9 mirror	13,000	80	16,000	60	14.0	3.3
9-mm × 20 in. High-Intensity	5/16 × 9 in. Orotip	85	58	16–16½ in. dia *f*/1.9 mirror	15,000	80	19,500	55	22.0	3.5
10-mm × 20 in. High-Intensity	11/32 × 9 in. Orotip	100	60	16–16½ in. dia *f*/1.9 mirror	16,000	80	20,000	60	20.0	3.0
11-mm × 20 in. High-Intensity	3/8 × 9 in. Orotip	120	65	16–16½ in. dia *f*/1.9 mirror	(20,000)	80	(23,000)	65	20.0	2.7
10-mm × 20 in. Hitex	7/16 × 9 in. Orotip	125	64	16–16½ in. dia *f*/1.9 mirror			24,000	65	19.5	2.4
10-mm × 20 in. Hitex	7/16 × 9 in. Orotip	130	66	16–16½ in. dia *f*/1.9 mirror	(21,000)	80	25,500	65	25	2.6
10-mm × 20 in. Hitex	7/16 × 9 in. Orotip	135	70	16–16½ in. dia *f*/1.9 mirror			26,500	65	32	1.7
10-mm Ultrex[4] Experimental	Experimental	165	80	Exper. *f*/2.0 mirror			(34,000)	(60)	45	
11-mm Ultrex[4] Experimental	Experimental	195	80	Exper. *f*/2.0 mirror	(28,000)	80	(35,000)	(65)	45	
Rotating, Condenser-Type Lamps										
13.6-mm × 22 in. New High-Intensity	7/16 × 9 in. Orotip	125	68	Condenser lenses at *f*/2.0	11,500	80	14,500	60	7.25	2.4
13.6-mm × 22 in. New High-Intensity	1/2 × 9 in. Orotip	150	74	Condenser lenses at *f*/2.0	16,000	80	19,500	60	14.0	1.9
13.6-mm × 22 in. New High-Intensity	1/2 × 9 in. Orotip	160	77	Condenser lenses at *f*/2.0	(16,500)	80	20,500	60	17.5	2.1
13.6-mm × 22 in. Hitex Super	1/2 × 9 in. Orotip Heavy Duty	170	70	Condenser lenses at *f*/2.0	17,500	80	20,700	60	16.0	2.3
13.6-mm × 22 in. Hitex Super	1/2 × 9 in. Orotip Heavy Duty	180	74	Condenser lenses at *f*/2.0	19,300	80	24,800	60	21.5	2.5
13.6-mm × 22 in. Ultrex[4] Experimental	Experimental	265		Condenser lenses at *f*/2.0	(26,000)	80	(28,000)	(60)		
13.6-mm × 22 in. Ultrex[4] Experimental	Experimental	290	80	Condenser lenses at *f*/2.0	(30,000)	80	(34,000)	(60)	45	

NOTE: Values in parentheses are estimated or obtained from limited measurements.

[1] Screen lumen figure is for systems with no shutter, film or filters of any kind; measured with 5-in. E.F. *f*/2.0 and *f*/1.9 projection lenses.

[2] % distribution refers to ratio of light intensity at side of screen to that at the center.

[3] Maximum light is value with system adjusted to produce maximum light intensity at the center of the screen.

[4] Experimental carbons burned with short protrusion in experimental water-cooled silver jaws.

FIGURE 3 is screen illumination with carbon-arc 35mm film—0.600 by 0.825 inch aperture.

Projection Arc Lamp Review

A Survey of the Latest Advances Made in Projection Arc Lamps Plus Information on Proper Installation, Operation, and Care

BRIEF: *In times of great technological change . . . such as the motion picture industry has been going through . . . one of the most difficult problems facing the exhibitor is how to keep up with all of the latest advances made . . . One area which has seen a great deal of activity is that of screen illumination . . . The demand for increased light made by the new systems has made it more important than ever that the theatre operator be aware of what is happening.*

In an attempt to offer some help along these lines . . . we have requested that the leading arc lamp manufacturers submit information and illustrations about their latest products . . . Thanks to their splendid cooperation we have been able to assemble this review . . . in which there is much valuable information . . . not only about the new lamps . . . but data on installation . . . maintenance . . . and operation.

The following firms supplied the information used in this article: Strong Electric Corporation, J. E. McAuley Manufacturing Company, C. S. Ashcraft Manufacturing Company, Inc., and the Theatre Equipment division of the Radio Corporation of America.

RCA WIDE-ARC LAMP SYSTEM

New motion picture techniques which gained their first wide acceptance during 1953 imposed new requirements on projection light sources as well as on theatre projectors and sound systems.

A noteworthy advance designed to meet the new screen lighting demands of wide-screen and 3-D productions was the RCA Wide-Arc System announced during the year by the Theatre Equipment division of the Radio Corporation of America.

Generating enough light to provide brilliant images on screens up to 70 feet in width, the new lamp is now widely used in indoor theatres showing pictures in the new dimensions, and also in drive-ins, where means of achieving greater screen brilliance is also an obvious advantage.

The RCA Wide-Arc operates with a 9mm, 10mm, or 11mm standard positive carbon, or with a Hitex 10mm positive carbon. The positive carbon rotates at the rate of 15 revolutions per minute, or nearly twice the rate employed in lamps of earlier design, providing maximum arc stability.

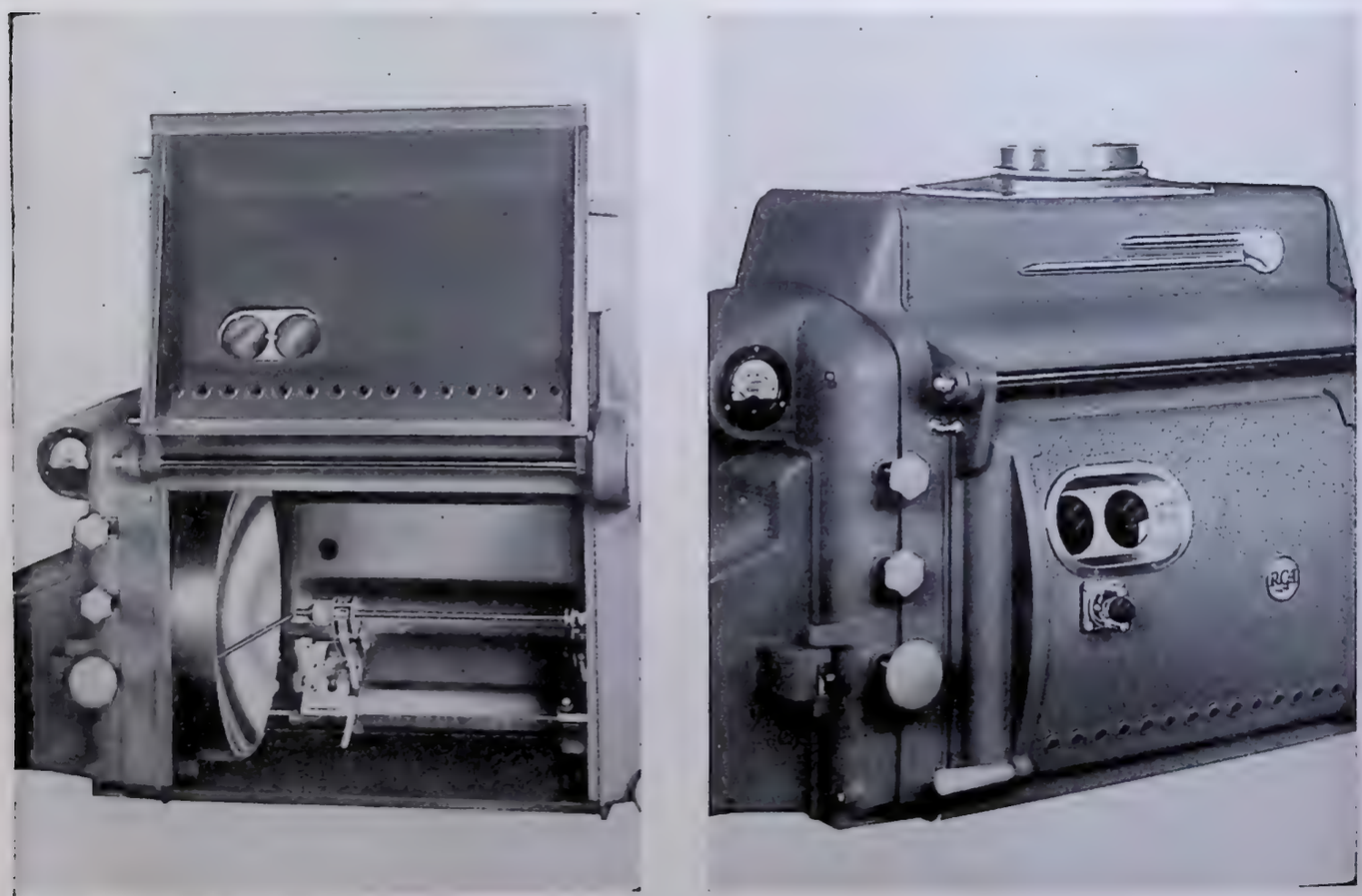
Features of the RCA Wide-Arc include special cooling devices, large 16-inch diameter reflector, fool-proof feed mechanism with rotating motion of the positive carbon, accurate positioning controls, and convenient dowser control handles.

Used With Any Projector

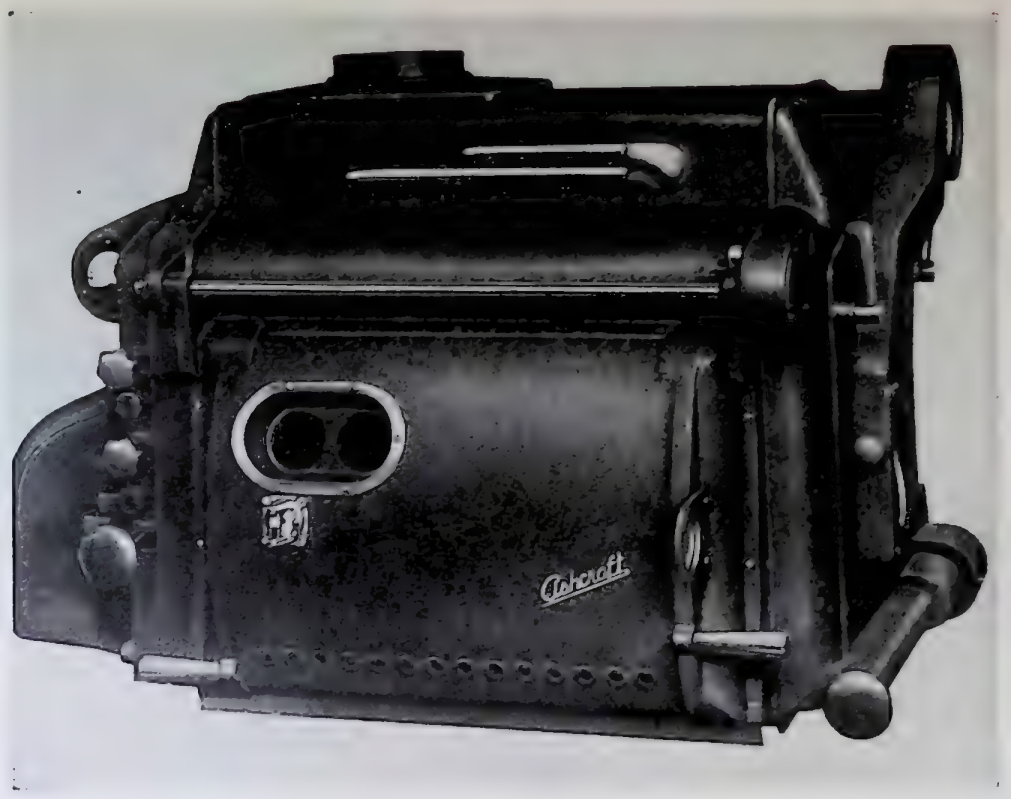
The lamp can be used with any type theatre projector. For operation above 100 amperes, it employes a unique heat reflecting glass with a motor-driven fan, assembled in a convenient housing which is mounted between the arc lamp and the shutter housing. The lamp system also employs a new RCA water circulator which operates directly from the arc voltage. When DC power is supplied to the arc lamp, the water circulator starts automatically.

Heat generated by the Hitex carbons is dissipated from the lamphouse by a low stack assembly located immediately

THE RCA Wide-Arc is seen here in an open (left) and closed (right) view. Some of the special features of this lamp are accurate positioning controls, cooling devices, and a 16 inch diameter reflector.



THE Ashcraft Super Power will fit any of the modern type standard make projection machines.



above the arc flame. This keeps both the reflector and the inside of the lamp free of combustion dust. A series of screened ventilating holes in the lamphouse base suck in cool air which instantly forces out heat, dust, and ash without interference with the arc flame stability.

Convenient dowser control handles are provided on both sides of the lamp at the end toward the screen. Horizontal and vertical carbon adjustments are located on the rear of the lamp. Simple adjustment knobs permit accurate vertical and lateral positioning of the reflector.

Two new motor generators to power the Wide-Arc lamp were also announced by RCA. They are the Type 19 motor generator for use on a 208-volt line, and the Type 20 for operation on a 220-volt line. Both provide 125/250 ampere, 90-volt output.

ASHCRAFT SUPER-POWER LAMPS

The Ashcraft Super-Power is the result of 35 years of experience in research and design of arc projectors. The lamp will fit any of the modern types of standard make projection machines. The alignment of the optical system of the lamphouse with the aperture and lens of the projector is of utmost importance. This is particularly so when used with the high speed f 1.9 or f 2.0 projection lenses.

When the Super-Power Lamp is installed in indoor theatres the distance from the silvered surface of the reflector to the aperture is to be 37¼ inches. This distance is best for projecting light with maximum illumination together with maximum distribution.

When the lamp is used in drive-in theatres, the manufacturer recommends a distance from the silvered surface of the reflector to the aperture of 36 inches. This distance is recommended for the reason that slightly more light will be projected, but with a slight lessening of distribution.

In the absence of aligning tools a simpler, but less exact method is to use a full 36 inch length of straight drill rod passed through the water jacket, the rotating head, and center of the aperture. The rod should then extend through into the lens mount, and if the alignment is correct, the end of the rod will be in the center of the lens mount. Of course, this is not an exact method of alignment. For this purpose, when a 10mm carbon is to be used, a 13/32 inch diameter drill rod should be used; for the 9mm, the diameter should be 11/32-inches.

Water Supply

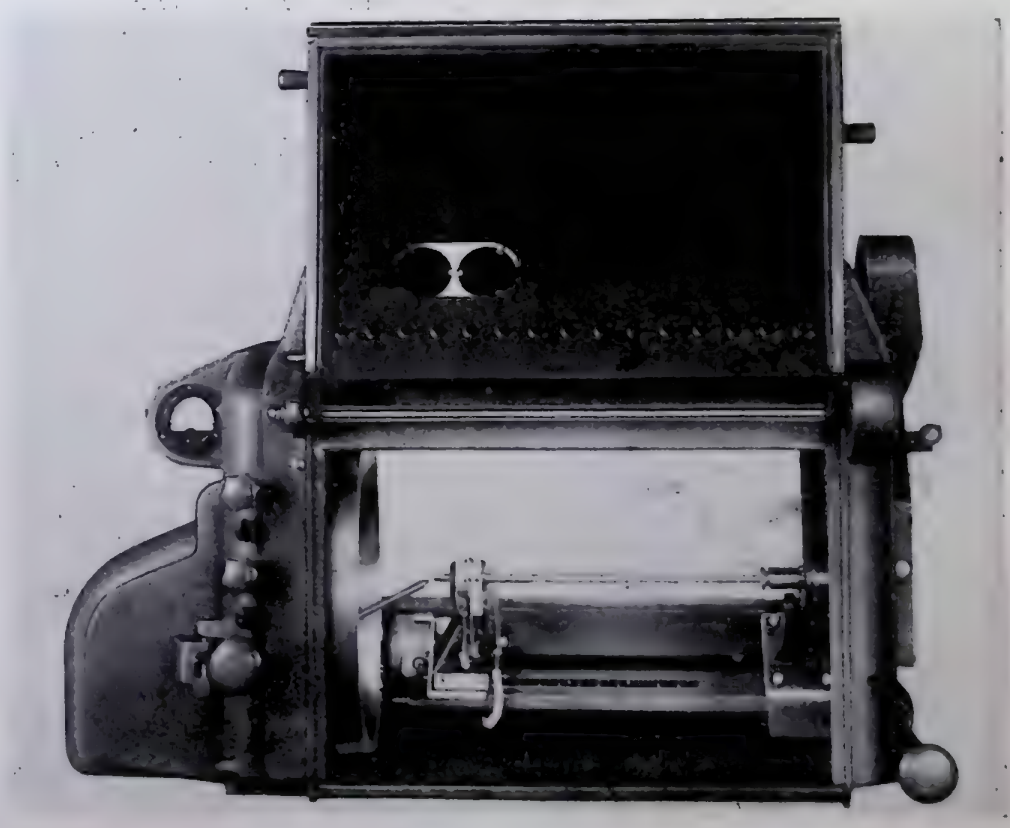
The preferred method of supplying water for the AG contact head is by means of the Ashcraft Water Circulator. The two six foot hoses supplied with the lamp are to be connected to the supply and return connections. It makes no difference which hose is connected to either connection.

The two wires, with terminals, extending from the flexible metal tubing, are to be connected to the lamphouse (or lamphouse switch) terminals, so that the circulator motor will start as soon as the main DC circuit to the lamphouse is closed. Polarity of the motor terminals may be disregarded, as the motor rotates in only one direction regardless of which terminal is connected to the positive lamphouse terminal stud.

The reservoir or tank should be filled to within one inch of the top with water. As a precaution, if local water contains a high percentage of alkali, then distilled water should be used.

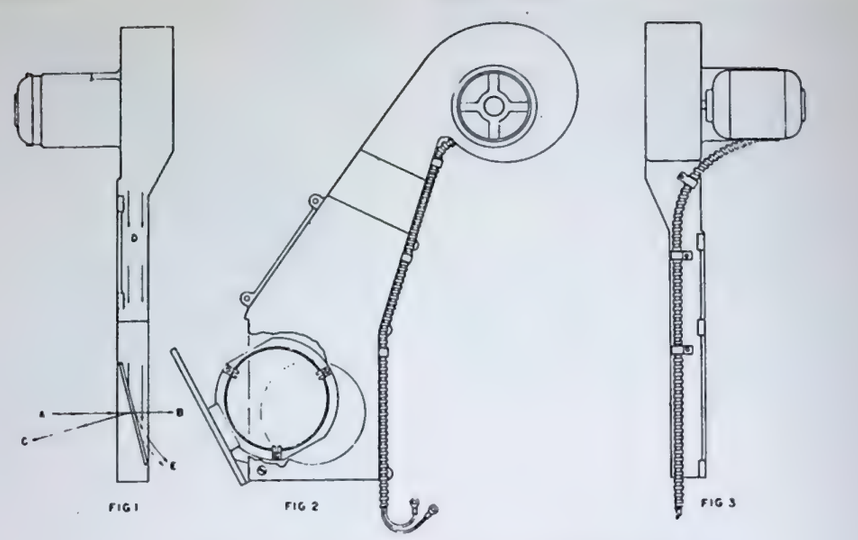
One and one-half pints of water per minute is the normal flow required, slightly less than this amount is adequate, but any amount over one pint is necessary.

Should the water supply fail during operation, no great damage will result, however, the chromium plating on the jacket may be damaged. It is recommended that after such failure the contacts be inspected for pitted or corroded surfaces, and carefully cleaned with a fine carborundum cloth.



INTERIOR view of the lamphouse showing large, high speed reflector. Note unobstructed lamp door.

DIAGRAM showing the Ashcraft air cooled heat deflector which eliminates 30 per cent of heat.



AG Contact Head

Several years of study, research, and development have produced the new AG contact head which is said to be the most perfect means of commutating the arc current to the rotating positive carbon presently available.

Not only does the new AG contact head perform the above function over long periods of time without the necessity of frequent replacement parts, but it also controls the heat generated and conducted rearwardly through the carbon, which heat not only deteriorates the core and shell of the carbon, but which would also have a deteriorating effect on the component parts of the contact head itself. This latter function is accomplished by means of a system of ducts in the forward section of the contact block, through which water continually is forced by means of the Ashcraft water circulator.

Obtaining Best Screen Light

After the arc has been regulated so that the two carbons remain on the indicating lines of the arc scope screen, the projector should be set in motion without film. The light should be thrown upon the screen. With hands on both the negative and positive manual control knobs, the entire arc should be moved slightly toward and away from the reflector. One point will be reached when the light is brightest, the distribution good, and the color whitest. This is the point where the arc should always be operated. Setting of the arc scope may now be made and locked into position.

Another method of determining the best position of the crater relative to the reflector, and at the same time checking the optical alignment, is by means of a pin hole aperture. These special aperture plates may be obtained from the various projector manufacturers.

A target, or any piece of light paper is held about 18 inches in front of the projection lens. When the light is projected through the pin-hole aperture the disc of light on the target should be uniformly illuminated by moving the crater toward and away from the reflector, the ideal position may be determined. When the crater is too far forward, a brownish color will appear, when too far away the field will be blue, but in the proper position it will be of uniform brilliance.



THIS Auto-Recirculator is another aid which helps to make the Super Power a better lamp.

Carbons and Arc Current

The 10mm high intensity projector carbon (or equal) has become generally accepted as the carbon most suitable for maximum screen brilliance — maximum light distribution together with reasonable carbon economy. This carbon has a current range of 85 to 105 amperes. In that range, screens with widths of 20 feet to 70 feet, or even larger, can be properly illuminated. Very large screens will require certain reflective finishes. No definite rules can be made as there are many factors which may increase or decrease the final results, such as focus, speed of lens, etc.

From our experience a theatre with good lenses, good projectors and a good screen does not require excessively high arc currents to obtain excellent screen illumination. The average screen of 30 to 50 feet wide may only require a current of 90-95 amperes, while the larger screens of 65 feet in width to the very large screens may require 100 to 105 amperes.

The rate of carbon consumption undoubtedly will have a strong bearing on the current used. Very few, if any, theatres would use a new carbon for every 2000 foot reel of film, but if two double reels 4000 feet can be obtained from each carbon then the consumption is well within the economic range. It remains to the judgment of the exhibitor and projectionist to determine the current required to project the amount of light required.

If a moderate current of 90 to 95 amperes is used we suggest that a 5/16 by 9 negative carbon be used, but in the 95 to 105 ampere range an 11/32 by 9 inch negative will be necessary to prevent excessive spindling. A reasonable amount of spindling is advantageous to prevent wandering of the arc which might occur if too large a negative carbon is used.

The use of 10mm carbons at currents above 105 amperes will require special carbons. The advisability of using these special carbons is questionable as the 10mm standard carbon at 105 amperes produces substantially the same quantity and quality of screen light as special carbons at 123 to 125 amperes. It cannot be assumed that the light projected is directly proportioned to the current used. This is not a fact. We repeat for the best light with reasonable economy the standard 10mm by 20 high intensity projector carbon (or equal) will give very satisfactory results even on very large screens.

Ventilation

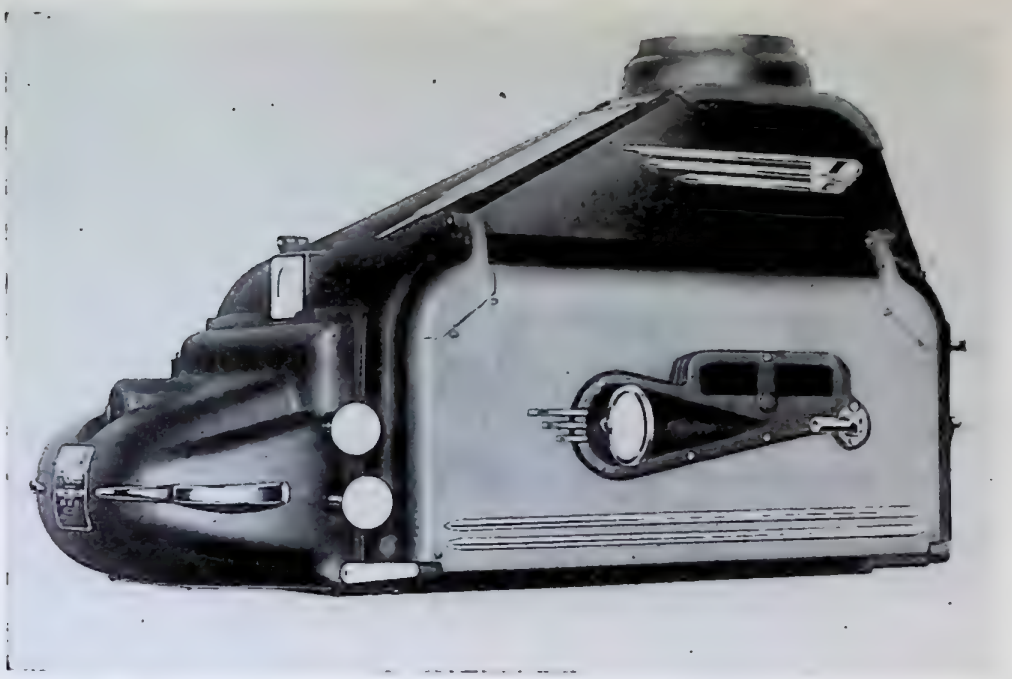
Adequate ventilation is one of the most important factors for successful operation of the Super Power Lamp. A draft tube extends directly over the arc from the lamphouse top to the top of the reflector ring. Sufficient draft should be applied to the six inch lamphouse stack so that when a sheet of paper is held approximately one and one-half inches from the lower end of the draft tube, it is snapped smartly up to the tube. The flow of air should not be lazy, it should be sufficient to draw off *all* the arc smoke and heat, in fact, the upper portion of the tail flame should be drawn into the draft tube.

If sufficient draft is applied, even on steep pitches such as 25 to 27 degrees, there will be no indication whatever of smoke deposit on the upper portion of the reflector.

The Super Power Lamp is equipped with a special ventilating door. The row of screened holes at the bottom, together with a row of baffled holes in the lamphouse base, allow an enormous amount of air to pass through the lamphouse without disturbing the arc.

Heat at the Aperture

With currents at from 85 to 92 amperes, there is a possibility of excessive



PEERLESS Hy-Candescent lamp is designed to be used in drive-ins and the large indoor theatres.

aperture heat which might cause embossing, buckling and resultant in an out of focus. The foregoing has been our experience but is not a guarantee. Various prints will have various buckling characteristics. It is well known, of course, that Technicolor film withstands a higher temperature without film damage.

At 95 amperes there is every possibility that excessive heat will occur at the aperture, particularly with black and white film.

At currents at from 118 to 128, there is almost certain damage to the film unless proper precautions are taken.

Air Cooled Heat Deflector

To eliminate film buckling in the higher ranges, it is suggested that when the Super Power Lamp is used it should be equipped with the Ashcraft Air Cooled Heat Deflector which eliminates approximately 30 per cent of the heat projected to the film with only approximately five or six per cent loss in visible light.

The air cooled heat deflector casting is mounted directly on the front of the lamphouse and held in position by five screws. The blower is driven by a direct current motor, the leads of which are carried through a flexible metalic tube, as shown in the diagram. On the end of the lead wires are two terminals which are to be connected to the lamp-house terminal studs. Connecting in this manner, the motor starts immediately upon closing the arc circuit.

The dichroic glass filter is mounted resiliently in the removable door on the side of the blower casting. The surface of the filters should not be cleaned with water but can be kept in good condition by means of wiping with surgical cotton.

In the diagram, figure 1 shows the path of the light at A-B. The reflected heat is shown at C and air blast at E. It is important that nothing obstruct the flow of the air over the filter in order to accomplish maximum cooling.

THIS diagram explains the function and adjustment of the arc stabilizing magnet which provides a neutralizing magnetic field around the arc.

PEERLESS HY CANDESCENT

The Peerless Hy-Candescent Lamp is a heavy duty arc designed to be used where large amounts of screen illumination are needed, such as on screens in drive-ins and large indoor palaces. The following is important information about installation, care, and treatment of this lamp.

Burner Alignment Principle

After temporarily fastening the lamphouse to the pedestal, the burner assembly should be put in place. As the burner is independently adjustable, both laterally and vertically within the lamphouse, there is provided a marker at the front and rear end of the lamphouse base when aligned with the markers on the burner base, will indicate when the burner is in the center of the optical axis of the lamphouse.

It does not necessarily follow, however, that with the alignment of these markers, that the axis of the burner will be in optical alignment with the optical axis of the projector mechanism, and it may be necessary to adjust the

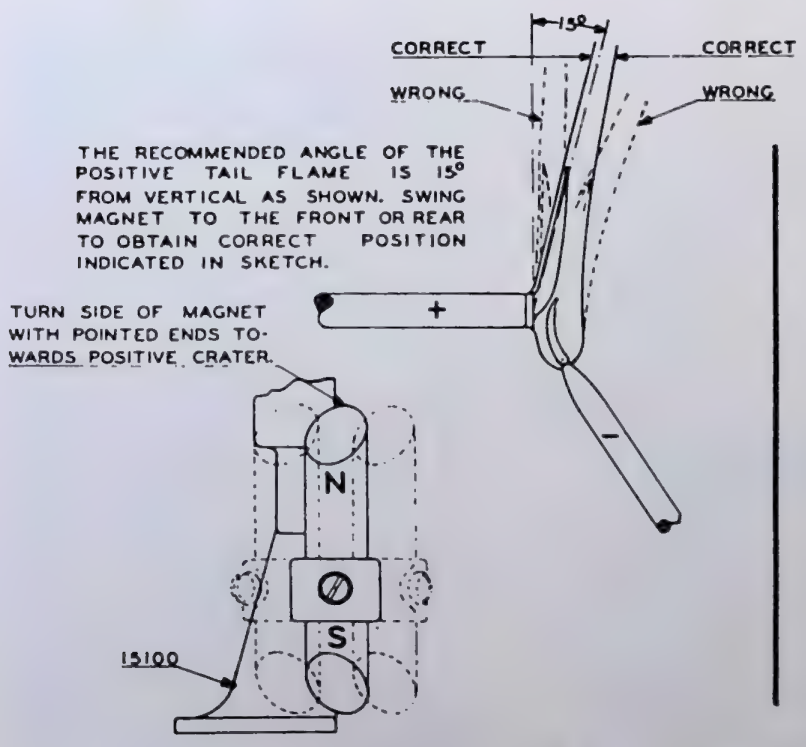


DIAGRAM #1

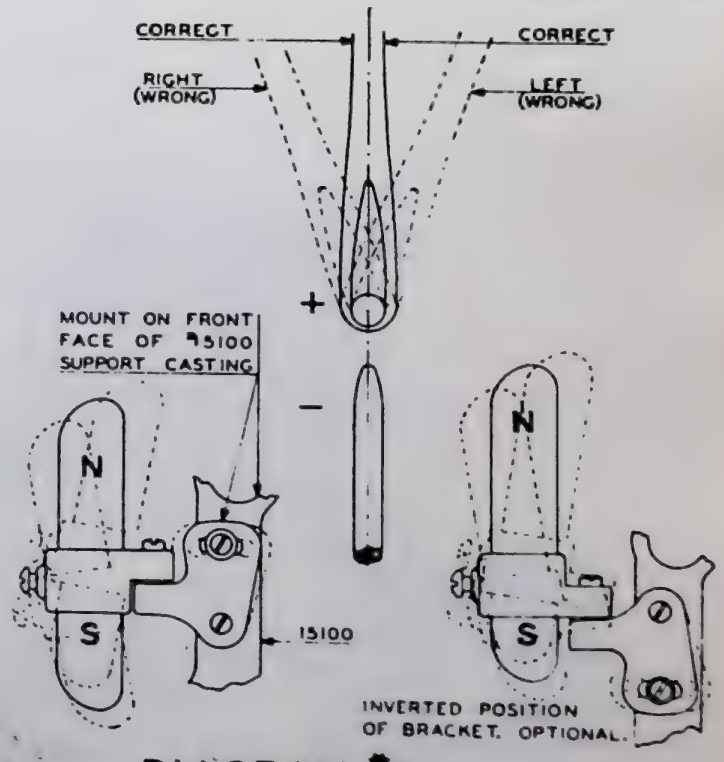


DIAGRAM #2

burner to a slightly different position to attain that result.

We recommend that this adjustment principle be thoroughly understood before attempting to install the burner in the lamphouse, since it is the preciseness of this alignment that will determine the quantity and quality of light on the screen.

Alignment Procedure

One of our optical alignment appliances should be purchased at the time new lamps are bought, because its use provides means for accurately aligning the optical axis, and also, to precisely set both the working distance between the Peerless Hy-Speed F-2.0 condenser system and the projector aperture or film plane, and the focal distance between the face of the positive carbon crater and the plane surface of the rear F-2.0 condenser lens.

If so ordered, the Peerless Hy-Candescent is obtainable equipped with a condenser mount and dowser arm to accommodate the Bausch & Lomb condenser lens system.

When using Bausch & Lomb parabolic-aspheric cinephor condensers, note that the rear surface of the rear lens is cylindrical. Its correct operating position is when the markers on the outer edge of the lens coincide with the markers on the face of the condenser mount casting. Due to its cylindrical rear face it is important that the lens retainer ring be unscrewed enough to allow the rear lens to be turned one-half of a revolution in the mount, and still have expansion space at all positions of the half turn.

When this system is used the optical alignment appliance may be used to align the optical axis, but the crater to rear condenser as well as the front lens to film line distances, must be determined through the use of a suitable measuring rule.

Amperage Range of Carbons

The Peerless Hy-Candescent lamp has a current range from 125 to 180 amperes. It has been designed to use the following carbons:

Standard Regular Trim
- **125 to 150 amperes, 68 to 78 volts.**
- **13.6mm by 22 inch high intensity positive.**
- **7/16-inch by 9 inch coated cored negative (½ by 9 inch negative from 140 to 150 amperes).**

New 180—A Super Trim
- **170-180 amperes, 74-volts.**
- **13.6mm by 22 inch positive.**
- **½ by 9 inch heavy duty coated cored negative.**

At infrequent intervals during normal operations, a relatively sudden increase of current may be noted as registered by the ammeter. Generally the cause can be traced to the development of small cracks in the shell of the positive carbon.

These cracks can plainly be seen in the projected image of the burning carbon on the imager screen at a point dicetly back of the end of the crater trim.

When such cracks occur they permit a leakage of gas from the crater, rarefying the gas, which condition in turn, reduces the normal resistance across the arc. During such periods the crater will become rather shallow and the rim of it burns to a pronounced rounded edge. The only remedy, under the circumstances, is to allow the cracked area of the carbon to burn away, or retrim at the first opportunity.

Arc Image Projector Adjustment

Mounted on the outside of the right lamphouse door is the arc imager lens holder. The image of the burning arc is picked up by a mirror and reflected through lenses mounted inside of the holder that focus it on the ground glass screen.

The lens holder is adjustable and the image of the arc may be moved in all directions to be properly located in on the screen. By loosening screws which hold it to the lamphouse door, and moving the entire lens holder straight forward or backward on the glass frame, the projected image can be moved to the right or left of the screen.

The screen holder with screen, may be tilted if desired, so that the projected image of the arc does not have to be viewed at a distorted angle as would be the case if the projection angle was exceedingly steep.

Lubrication Recommendations

Graphite or a lubricant containing graphite should *not* be used on any part of the burner mechanism.

Due to the generous size of the lamphouse, provisions for exhausting the heated air and gases through use of eight inch chimney and piping system and the further cooling effect of the forced draft of the blower, the temperature of the burner parts do not reach the point of carbonization of high-grade automobile engine oil; hence, we recommend its use as a proper lubricant. About No. 20 S.A.E. viscosity will be found best.

Only one drop of oil per week should be applied to all oil cups, including the motor. Wipe off excess oil immediately should it over-flow the oil cups when injecting oil into them.

One drop of oil should be applied on the inside faces of the front and rear outer clutch races and the center flange on the inner race.

Oil may best be applied to the surface of the negative and positive carriage guide rods, as well as the teeth of the negative feed rack and pinion, by placing oil on the ball of the middle finger and rubbing it over their entire surfaces therewith and then wipe dry with a cloth.

All rotating parts operate at exceedingly low speeds,—many make less than one revolution per hour, so do not oil and avoid the troublesome consequences of so doing.

All parts of the burner mechanism are convenient to reach, and they should be wiped clean before the start of each day's run.

PEERLESS MAGNARC

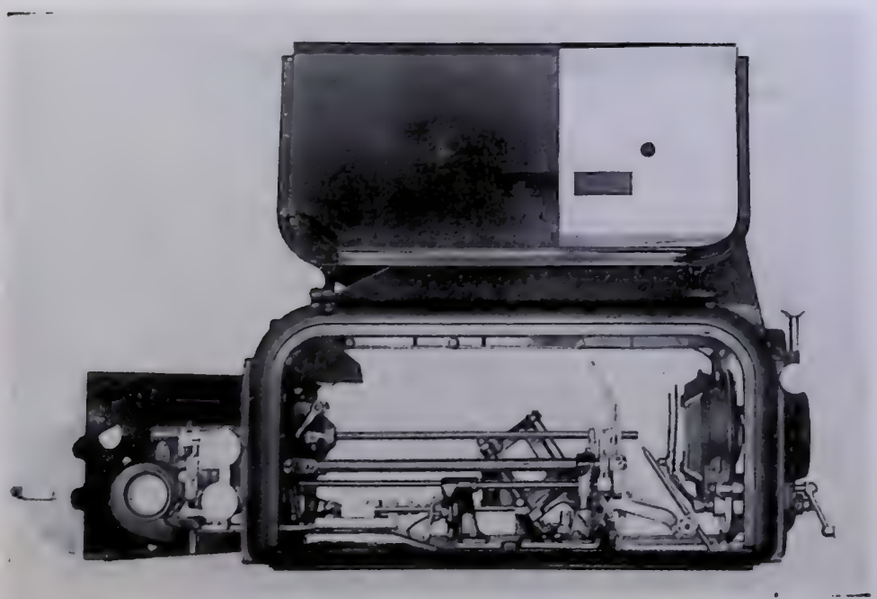
The Peerless Magnarc high intensity lamp is designed to operate from 1-K.W. (40 amperes 27 volts) to 75 amperes 45 volts. As a consequence this lamp may be operated with any multiple arc type motor generator, or a 110 volt direct current service, or with a rectifier, providing the current capacity of the rectifiers or motor generator is sufficient for the current rating of the carbons to be used in each lamp.

Low voltage motor generators and rectifiers having satisfactory outputs are available for use with this arc. These lamps may also be operated from higher voltage generators if proper ballast rheostats are inserted in the circuit to reduce the generator output voltage to that required at the arc.

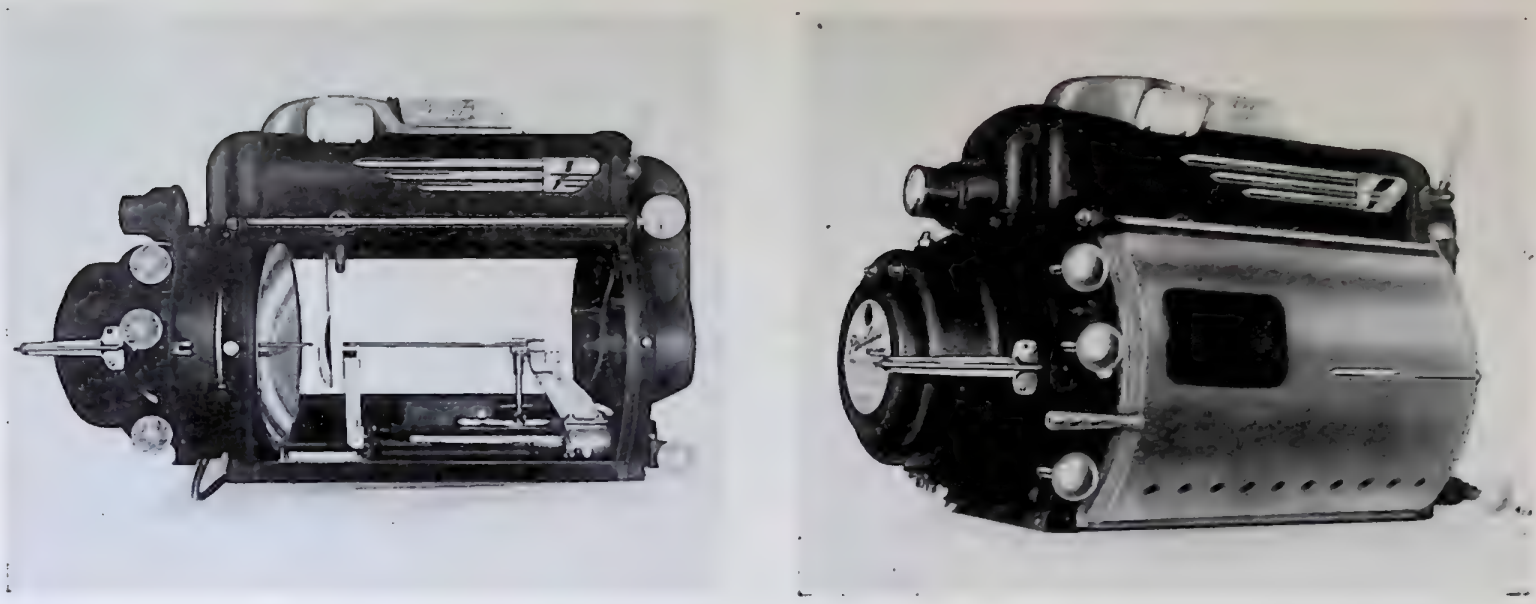
After installation, however, if it is found desirable to change the original carbon sizes to use more or less current, this may be accomplished with very little effort in the projection booth by simply changing two gears.

Lamphouse Ventilation

The Magnarc operates at relatively low arc voltage and precautions should be taken to guard against air drafts which will disturb the arc. If forced



AN INTERIOR view of the Peerless Hy-Candescent. All parts of burner mechanism easy to reach.



THE Peerless Magnarc seen above in an open-closed view, is designed to operate from 40 amperes, 27 volts, to 75 amperes and 45 volts.

draft is employed in the vent pipes to carry off the arc gases, the chimney damper should be installed just above the lamphouse chimney base in the exhaust piping to permit draught regulation to a point where no arc disturbance occurs.

It should be borne in mind, however, that in order to keep the temperature inside the lamphouse as low as possible, this ventilation should not be completely choked. A good rule to follow is to open the damper as wide as possible without draft disturbance to the arc.

A six inch chimney outlet is provided on the Magnarc and all additional piping in the booth should be six inches or larger, if proper ventilation is to be had. Where forced ventilation is not employed, care should be taken that no down draft will occur, as it will cause equal disturbance to the arc.

Carbon Trim Alarm

The carbon trim alarm feature is regularly furnished as standard equipment only in the "Deluxe" models of the Magnarc. The aim of this feature is to provide a visible warning to the projectionist, after a changeover has been made to the second projector, that insufficient carbon remains in the lamp just extinguished to last another reel.

The time period for the lighting of both the positive and negative light is adjustable. Adjustment of the positive, is by means of the adjustable pointed rod that operates the switch, the limits of which can still be increased or decreased by moving the positive switch position forward or backward from its central position on the lamphouse base. Additional switch mounting holes are provided in the base panel to permit this.

The negative time period may be adjusted by changing the position of the bakelite stud, on the negative feed rack, which operates the switch.

Rear Shutter Interference

When an installation is made on projectors having certain types of "barrel" rear shutters, it will be found that approximately 35½ inches will be the shortest working distance that can be obtained between the reflector vertex and the aperture of the mechanism because of the added space that must be provided between the lamphouse front and the rear shutter assembly to allow for the opening of the film gate for threading.

At its correct working distance the light speed from a genuine glass Peerless Magnarc Reflector is F-2.1. In a cone of light this "F" speed, the widest vertical included angle of light that will pass through the projector mechanism aperture is 26-3/5 degrees, beginning at an apex point on the optical axis line that is 1-9/32 inches beyond the aperture. Hence, to prevent excessive light loss and shading on the screen picture field the reflector light beam must have free passage to the aperture within a similar conical area, without interference from the projector mechanism rear shutter housing, rear shutter hub or wings, sight box, and aperture heat shields.

As some types of "barrel" rear shutters, vertically, can not pass a cone of light having more than an inclined angle of 22 degrees, begining at an apex point on the optical axis line that is 1-17/32 inches beyond the aperture opening, such "barrel" sutters inherently cause a higher light loss than will result from operating the reflector at the 35½ inch distance mentioned above.

The conventional "disc" and "saucer" type rear shutters and their housings generally permit free passage of a cone of light having a circular included angle of 30-2/3 degrees, beginning at an apex point on the optical axis line that is 1-3/32 inches beyond the aperture.

Focusing Arc on Image Screen

Because it is possible to operate the Peerless "Deluxe" and "Special" Magnarc Lamp on such a wide range of current, from the so-called 1-K.W. trim using 40 amperes to the 8 and 9mm trim using 75 amperes, two different arc image screens are available. One screen is exclusively for use when the 1-K.W. (40 amperes, 27 volts) carbons are used and the other screen should be used with the regular carbon trims having current ranges of from 42 to 75 amperes.

We draw particular attention to the above, to be assured that the correct indicator screen is used before proceeding with the adjustment of the arc imager unit as follows:

Close the projector knife switch and by turning the knob plate, strike the arc and separate the carbons about one-fourth inch. After a crater has formed push inward on positive carbon knob, plate, and manually adjust the positive carbon until its crater face is in the same vertical plane as the front edge of the carbon guide chute plate. Observe whether the projected image of the carbons arc is in the approximate center of the screen. If not, loosen the mirror swivel screw and adjust mirror. Retighten screw after adjustment to hold mirror at the correct angle. Observe whether the projected image of the positive carbon coincides with the vertical line marked "positive" on the arc image screen. If it does not, the image may be placed on the line by slightly loosening the three upper screws that hold the arc image lens assembly to the lamphouse top and rotate the assembly clockwise or counter-clockwise around its axis, and retighten the three mounting screws. Before making this adjustment, see that the positive carbon crater itself is in the correct position, namely, in the same vertical plane as the front edge of the carbon guide chute plate. The negative carbon should then be adjusted by hand until the image of its end is even with the vertical line marked "Negative" on the screen.

For satisfactory operation of the arc feed it is essential that the images of the ends of the positive and negative carbons be maintained exactly on these lines.

Function of Arc Stabilizing Magnet

The adjustably mounted arc stabilizing magnet makes possible for the first time, in high intensity arcs employing copper coated carbons, a means for the

PROJECTION arc lamp recommendations for the various principles of indoor film presentation.

INDOOR THEATRES

For Screen Widths Up To:	2-D Matte Screens	3-D Projection	Wide Screen Aluminized	Cinemascope
20 feet	1 KW	Mogul		
25 feet	46-Ampere	Mighty 90	1 KW	
30 feet	Mogul	Mighty 90	46-Ampere	
35 feet	Mighty 90	Super 135	Mogul	Mogul
40 feet	Super 135	Super 135	Mighty 90	Mogul
45 feet	Super 135		Mighty 90	Mighty 90
50 feet			Mighty 90	Mighty 90
55 feet			Super 135	Mighty 90
60 feet			Super 135	Super 135
65 feet			Super 135	Super 135
70 feet				Super 135

complete control, stabilization and the impressing of the gases of the core of positive carbons, into the crater thereby materially increasing the percentage ratio of lumens per arc watt of the total light generated by the arc, at no increase in current or carbon costs.

The magnet is made of cast "Alnico." It is a double bevel end, bar type. It is adjustably positioned, well above the axis of the carbons, so that the entire magnetic flux force is exerted against the arc crater and its gases, with an impressing effect.

Provision is made, so that the magnet's flux field can be adjusted in directions, parallel to the positive carbon crater face and also toward or away from the crater, coaxial with the carbons. The method of mounting also permits a tipping adjustment, in a horizontal plane, and hence, complete control of the burning arc's characteristics is attained.

THE STRONG SUPER "135"

The Strong Super "135" has been designed especially for those applications where the light requirements far exceed the capacities of lamps heretofore available. This lamp was designed especially to project the tremendously increased volume of light required for wide-screen and polaroid 3-D presentation on the tremendously wide indoor screens and those in larger drive-ins.

The Type No. 90001 Super "135" burns 11mm regular carbons up to 120 amperes, and the Type No. 90002 burns the new 10mm "Hitex" carbons up to 135 amperes, both projecting a much higher level of illumination than any other lamps. In impartial tests the foot candle meter proves that the Super "135" is the most powerful of all lamps, according to the manufacturer.

Accommodating a 20-inch carbon, the Super "135" is the only reflector arc lamp which can burn the 10mm "Hitex" carbon at 120 amperes or 11mm regular carbons at 115 amperes for a full hour as required by 3-D 5000-foot reels. The Super "135," furthermore, maintains a screen light that, in intensity and color value, is constant and identical to that of the associated lamp which is burning simultaneously.

Cooler Unit

The new Infra-Ban Beam Cooler Unit, positioned in the path of the light beam, permits the free passage of the visible light rays while diverting the heat rays away from the aperture and back into the lamphouse from which heat is rapidly withdrawn by a mechanically induced air flow out through the stack. Thus, the Strong Super "135" makes possible a tremendous increase in useable light without a corresponding increase in heat at the aperture.

The position of the positive arc crater is automatically maintained at the exact focal point of the reflector by means of Strong's exclusive Lightronic Crater Positioning System. The positive and negative carbons are advanced by separate motors, the speeds of which are governed by the Bi-metal Lightronic Tube. Once the arc has been struck, the crater positioning and the gap length are automatically maintained without manual adjustment.

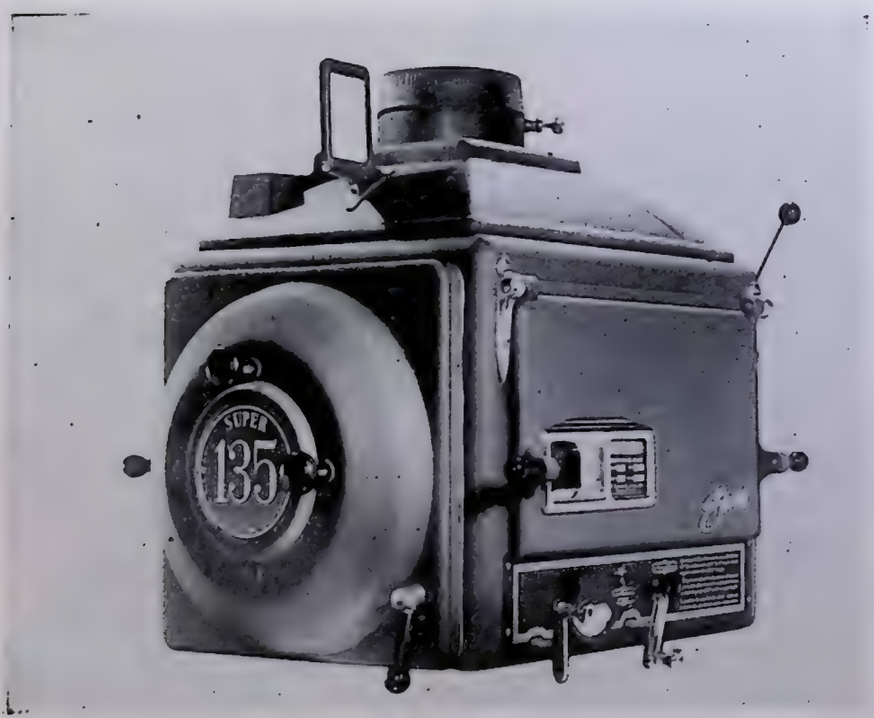
A stream of air directed just above the arc stabilizers its burning, assures complete combustion of any black soot, and carries away the white smoke which would otherwise be deposited on the reflector.

The lamphouse measures 35 inches long by 24 inches wide by 28 inches high which large content of 20,000 cubic inches combines with the forced air cooling of the positive carbon feeding mechanism to assure low operating temperatures within the lamphouse even when burned at this high amperage.

Optical System

The optical system comprises an elliptical reflector 16½ inches in diameter with a resultant speed of f1.9 to match the currently available high speed f1.9 projection lens. The mirror and its tilting mechanism are an integral part of the back door of the lamphouse, which swings out to allow easy cleaning of the reflector and convenient trimming of the lamp.

The Strong Super "135" features unit construction whereby the various components are instantly removable for cleaning and inspection. The lamphouse is finished in attractive gunmetal gray with chrome trim and weighs 165 pounds. There is an arc imager; ammeter for reading the current at the arc; an automatic trimming and framing light; and an inside dowser system.



THE Strong Super 135 has been designed to meet the special light demands of 3-D and wide screens.

Motion Picture Screen Review

A Survey of the Various Types of Screens Presently Available and the Various Features and Advantages to be Found in Each

BRIEF: ***In addition to all of the many functions which go into the everyday operation of a motion picture theatre . . . the exhibitor today also has to keep up with the great mass of technical changes that are taking place . . . in order to be able to keep abreast of the times . . . The problem of getting this information can be a difficult one . . . An area which has seen a tremendous amount of activity is the motion picture theatre screen . . . In an attempt to aid the reader in getting a fuller comprehension of what is available to him . . . we are offering this article which attempts to give some idea of the features and construction of a number of the leading screens on the market . . . The data was supplied by the manufacturers . . . and it should be remembered that it is almost impossible to cover all of the points which may apply to the selection of a screen for a particular theatre . . . The purpose of this article is to acquaint the reader with these screens in order to furnish a broader base upon which to make the final decision.***

When the rash of new dimensions hit the industry, exhibitors who thought that they knew their business fairly well found themselves completely confused by the mass of technical information which they needed in order to properly appraise their situation, and to purchase the equipment which best suited their particular needs. Certainly in the area of motion picture screens the situation at times bordered on that of chaos. Fortunately, through the efforts of the various screen manufacturers that condition is no longer prevalent. However, there is still much which the theatremen would like to know.

In an effort to give the exhibitor some idea of the various types of screens presently on the market, and the features of each, THEATRE CATALOG is offering this short review. While it is not the intention of this article to enable the exhibitor to purchase a particular screen on the basis of what is found here—this would be almost impossible since each individual theatre calls for individual treatment—it is hoped that it will provide a convenient guide.

The information presented here has been supplied by the manufacturers.

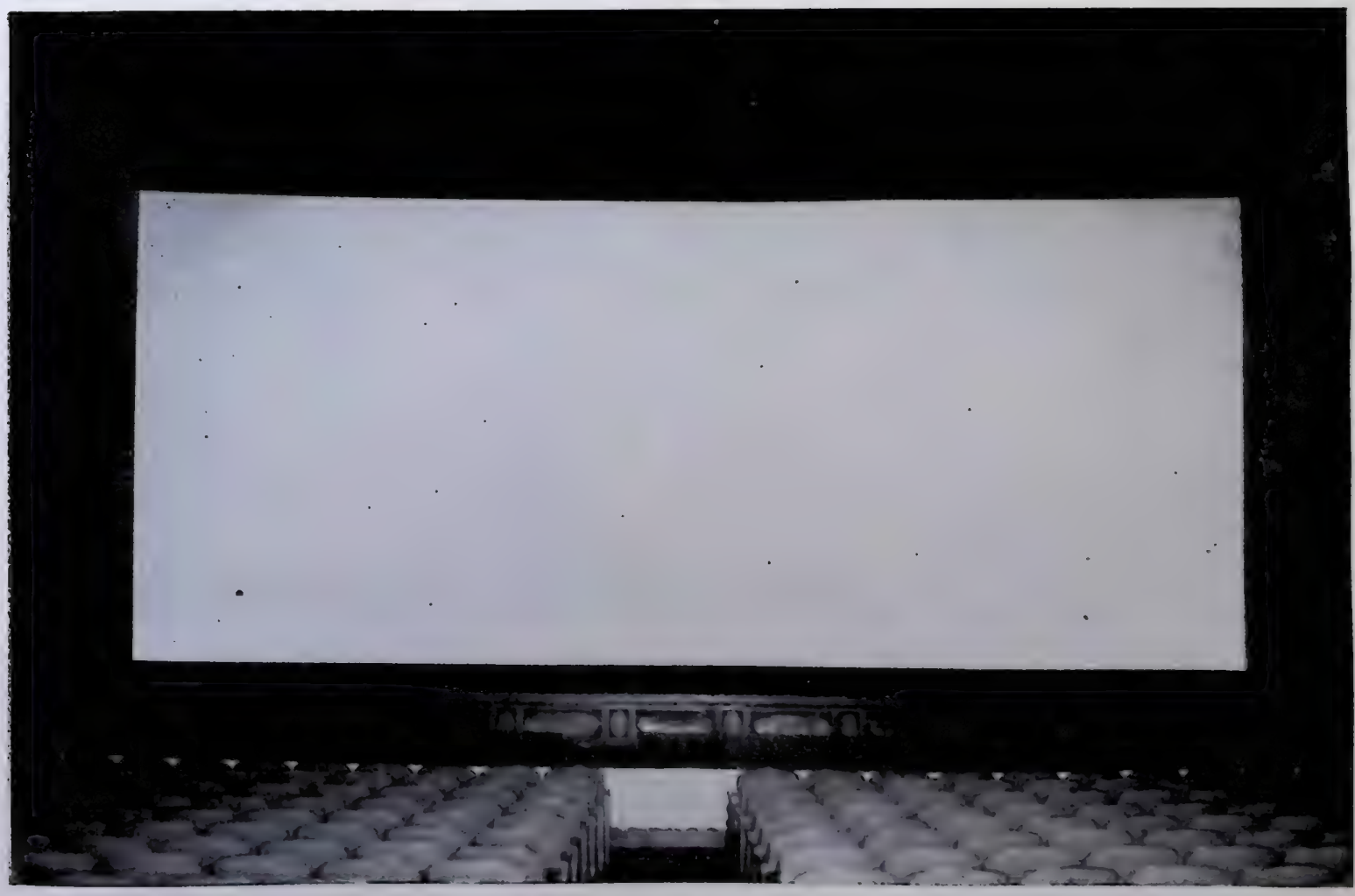
WALKER HIGH INTENSITY

Walker American Corporation makes a complete line of theatre screens, but is concentrating most of its efforts on the production of Walker High Intensity screens, due to the great demand for these screens.

Of all the qualities of the High Intensity screen, the firm prides itself the most on its seamless construction and uniformity of surface. It is known that any picture can be ruined if it is projected on a screen with visible seams and a streaky or uneven surface.

The High Intensity screen is a modification of a screen made by Walker during the war for the Navy's Mark 1 Gunnery Trainer, which used Polaroid three-dimension to simulate actual combat conditions.

To meet the requirements of three-dimension, at the present time, as did its predecessor during the war, the High



THE RAYTONE Hilux all-purpose screen has been installed at the Paramount Theatre, New York.

Intensity screen has an extremely high retention of polarization, which eliminates double image and "ghosting," which can be caused by a screen not properly designed to handle projected polarized light.

Besides this, the uniform seamless surface of the High Intensity screen brings out the best in three-dimension projection, as annoying visible seams and surface streaks become even more objectionable in three-dimension than in two-dimension.

Plastic Compound

The surface of the High Intensity screen is a plastic compound, molded in one continuous piece over a cloth backing. The surface is not flat, but is composed of thousands of elliptical contours. This elliptically-contoured surface aids in the distribution of light over a wide angle, which is so necessary with wide screen projection.

To meet the need for additional picture brightness for wide screen projection, the High Intensity screen has a brightness gain over twice that of a white screen. This brightness or reflectivity is controlled so as to give as bright a picture as possible without specularity, which would result in an objectionable "hot spot" or glare.

The High Intensity screen is designed to maintain its reflective efficiency over a long period of time. This is done by using metallic pigments made of an alloy which does not oxidize or tarnish, combined with plastic materials which do not oxidize or discolor. Not only does this keep up the reflective efficiency of the screen, but it keeps the screen from changing color, which is as harmful to good projection as the loss in reflective efficiency.

The High Intensity screen has a uniform reflectivity over the entire visible spectrum. The color of the reflected light is the same as the color of the projected light, which gives a faithful reproduction of color in color pictures. Blues are blue and not greenish blue, reds are red and not washed-out or off-color reds, and as the screen does not change color with age, this faithful reproduction of color continues throughout the life of the screen.

Resists Dirt

The High Intensity screen has a smooth, hard, metallic surface which is almost impervious to dirt. It can easily be kept clean by frequent brushing. The surface of the screen, while contoured, is smooth, and lends itself to cleaning with a dry brush. How often the screen must be brushed will depend upon the local conditions and how rapidly dust collects on the screen.

Holes for the transmission of sound are molded as tiny flaring horns with smooth plastic walls. Each miniature horn starts at the back of the screen, flares smoothly outward. These molded holes reduce the friction of sound waves passing through, do not clog with dirt, and result in high fidelity sound transmission during the life of the screen.

The Walker High Intensity screen is made in any proportion and can be installed either flat or curved, as desired.

RAYTONE HILUX

The Raytone Hilux Screen for theatres is an all-purpose screen for CinemaScope, VistaVision, all other wide-screen systems, 3-D, 2-D, color, or black and white.

The Raytone Hilux was evolved after two years of research and development. It is a thermoplastic product of extra heavy weight, tearproof in construction. The heavy plastic sheeting is inert and is subject to an extremely slow rate of deterioration.

Metallic Pigments

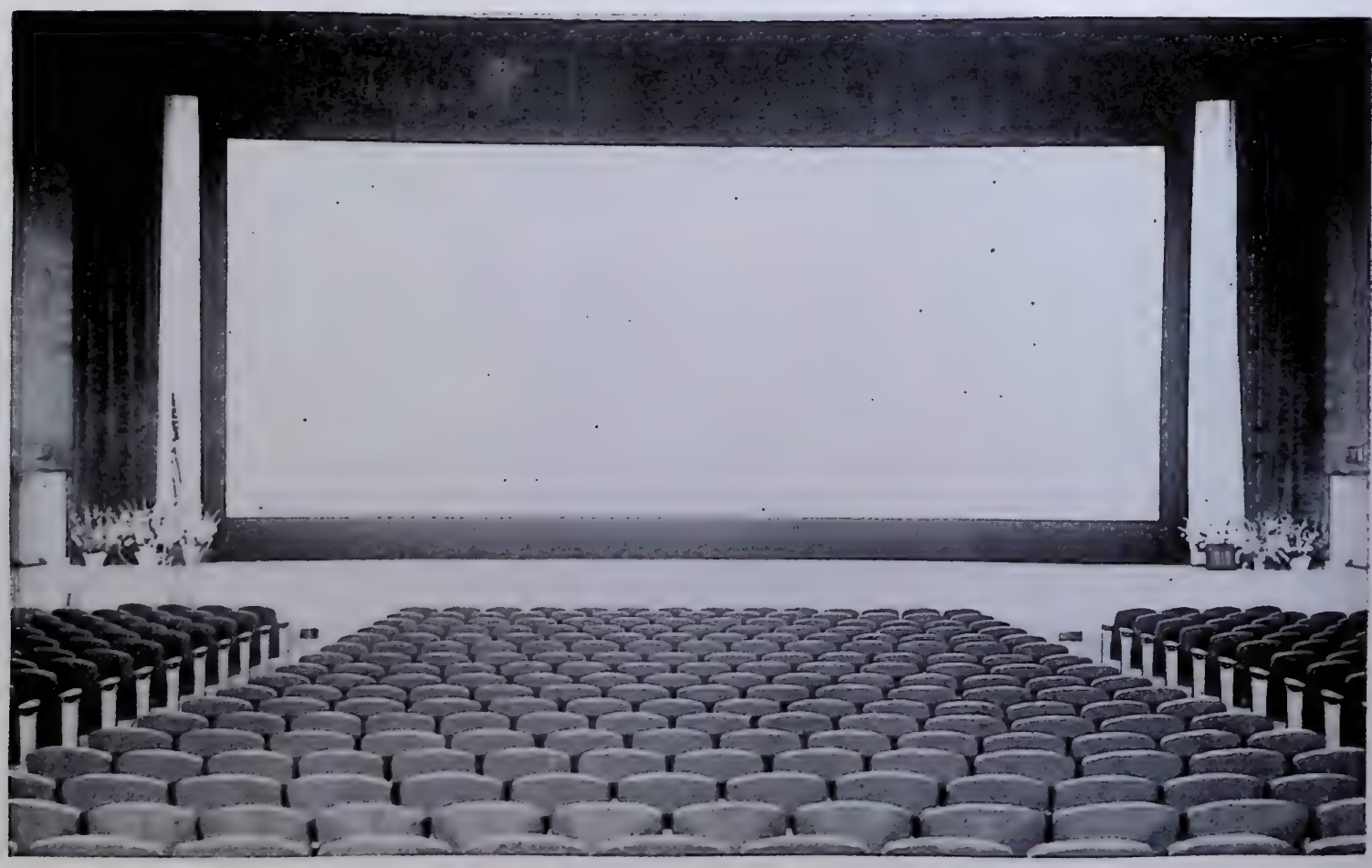
An integral coating of metallic pigments provides a projection surface with the required brightness of wide-screen systems. Experience and research indicated that a brightness gain of 2.85 is required to satisfactorily reflect all of today's projection systems. The Raytone Hilux provides this brightness while its unique composition and texture give the required diffusion of light throughout the average theatre.

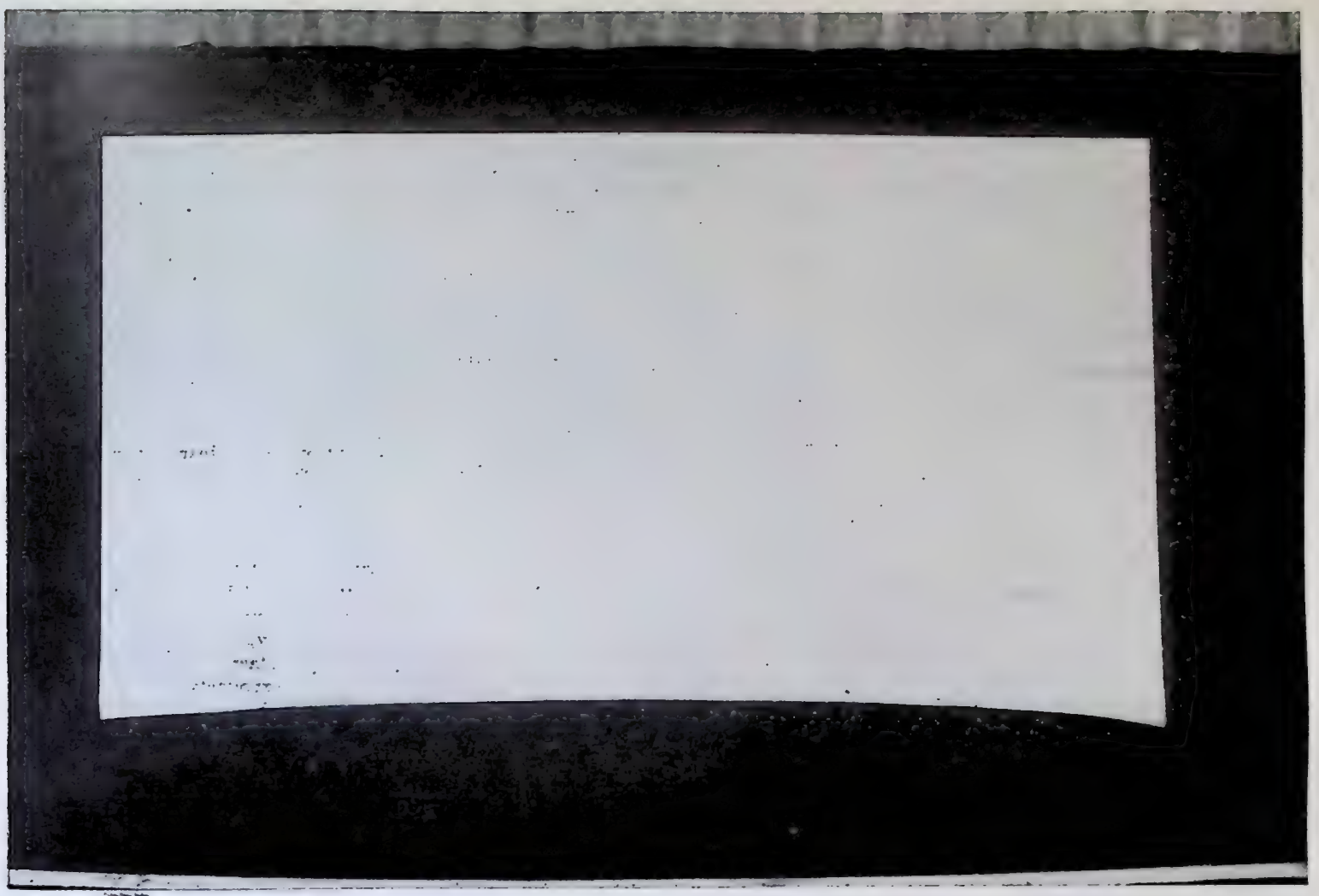
The entire screen is formed into one sheet before the highly complex process of coating is performed. As a result, the Raytone Hilux can be absolutely guaranteed to provide a completely seamless picture from any point in the theatre.

The Raytone Hilux Screen is also flameproof and mildewproof. It is packaged at the plant so that it may be unpacked and hung easily by unskilled labor.

The Hilux has been proved successful in the field. This is attested to by the largest screen sales volume in Raytone's history. Raytone white screens are also available, but the company cautions the exhibitor to make a proper evaluation of light before a white screen is installed

THEATRE installation of the RCA Dyna-Lite all-purpose screen. Maximum size is 30 by 65 feet.





THE PALACE, Akron, O., has the Williams all-purpose silver screen. Seams are invisible.

in preference to silver. Under normal circumstances, white screens are not as effective as silver with wide-screen systems.

Raytone is equipped to provide both silver and white screens in all sizes for all systems of projection.

RCA DYNA-LITE

At the present time the Radio Corporation of America is offering exhibitors two 100 per cent plastic motion picture screens, the RCA Dyna-Lite and the RCA Snowhite.

The Dyna-Lite is new all-purpose silver screen which is capable of giving satisfactory results for the projection of 2-D, 3-D, or wide screen film productions. As a result of an electronic welding process the seams in the Dyna-Lite screen are invisible to the audience during the projection period. This also tends to reduce or eliminate the reflections and distortions which might otherwise be found around the seam areas.

The material used in this screen is rugged and will resist puncturing. Because of the electronic welding of the seams, which have considerable strength and durability, it is possible to stretch the screen to the point where it will present a smooth surface.

Since the aluminum-pigmented surface is applied after fabrication, it is of uniform quality from end to end, thus assuring a clear sharp image at the center and edges of the screen.

The sound transmission characteristics of the Dyna-Lite screen meet the requirements necessary for either standard or stereophonic sound. At the present time RCA reports that the Dyna-Lite can be made in sizes up to 30 by 65 feet.

LUXURIA

The Stewart-Trans-Lux Corporation is manufacturing the Luxuria seamless all-purpose screen. One of the outstanding features of this screen is that it may be made in one piece up to a length of 90 feet, and is completely perforated for use with any of the existing sound systems.

According to the manufacturer it is often possible for a theatre to drop its amperage after the installation of a Luxuria screen, and still achieve more brilliance. A smooth even distribution of light with no fall off or fuzziness on the sides is assured.

The Luxuria is custom-tailored, and may be purchased in three different viewing angles, in order to accommodate a variety of auditorium conditions. These viewing angles are medium, wide, and extra wide.

Since this screen is completely washable the maintenance problem is of little consequence.

The Luxuria screen is distributed by the Trans-Lux Corporation.

BODDE

The Bodde screen, which is made by the Bodde Screen Company, is cast in one piece and seamless up to a size of 35 by 90 feet. It is said to be free of streaks, "clouds," and perforation blemishes. The basic screen material is double weight in thickness for greater strength, and has been approved by the U. S. Air Force for fungus resistancy, according to the company. The Bodde screen is washable with any soluble soap solution, or can be cleaned by just flushing with clear water.

With respect to sound qualifications of the Bodde Seamless, the Motion Picture Research Council reports a one-half DB loss, which is said to be less than any other screen reported as yet. This is due mainly to the fact that the screen is manufactured from ethyl cellulose instead of the usual spongy vinyl type material.

The Bodde is certified as flame-resistant by the State of California.

The only cloth in the screen is the molded binding on the edges. The highly reflective aluminum surface retains its stability because the aluminum is incorporated in the basic sheet itself.

This screen is available in three reflecting factors. Type A, for a narrow theatre, has a 4:1 gain factor; Type B, for a medium width theatre, has a 3:1 gain factor; and Type C, for a wide theatre or a steep balcony, has a 2½:1 gain factor.

The Bodde screen is shipped in kiln-dried wooden boxes on three inch seamless aluminum poles, with cotton soft liners between screen surfaces for surface protection in shipping and storage.

MAGNIGLOW-ASTROLITE

The Magniglow-Astrolite screen is considered to be the only optically engineered screen by the developer and producer of the material, the Glowmeter Corporation. It is a laminated sandwich of cloth, silver and plastic, and is guaranteed to meet standard requirements as regards fireproof and fungusproof qualities.

This all-purpose screen has invisible seams, and because of its lenticular pattern, it delivers uniform brilliance over any specified field of vision. It is said to give very satisfactory results as regards color fidelity, and can be used to project standard 2-D, 3-D, or wide screen films.

The seams are put on with a new Glowmeter developed hypertronic weld which is said to make the seams almost invisible to the eye, and can't be seen at all during the projection.

Except for the Canadian territory the Magniglow-Astrolite screen is distributed by the Radiant Manufacturing Corporation.

For additional information about this screen see the article, "Astrolite Reflection Theory," in this issue of THEATRE CATALOG.

WONDER-LITE

Another of the all-purpose screens designed to meet the demands made by the various types of screen presentations is the Wonder-Lite silver screen manufactured by Da-Lite Screen Company, Inc. It is claimed that while this screen offers a soft light that reduces or eliminates the possibility of audience eyestrain, it also gives a maximum light return.

As a result of the spacing of the perforations over the entire screen the Wonder-Lite has full sound range fidelity. The material used in its manufacture is extra strong, and is highly resistant to tarnish, flames and mildew.

It is said that this screen holds between 90 and 99 per cent polarization for 3-D pictures, and gives authentic reproduction of color in 3-D, 2-D, and wide screen offerings.

VOCALITE

The Vocalite Screen Corporation's entry in the screen derby is the 100 per cent all vinyl "plas-tec" screen known as the Hi-Lite. This screen may be had in all sizes and is available in either a perforated or non-perforated form.

The Hi-Lite has been tested as having a light reflection value of 90 per cent, and a whiteness ratio of 94.6 per cent. The material is highly resistant to stains, and is washable, making it easy to maintain. The Hi-Lite is also mildew and flameproof. These features, coupled with the sturdy qualities of the material make it a fine all-purpose screen.

This screen has been installed at the Radio City Music Hall, New York City.

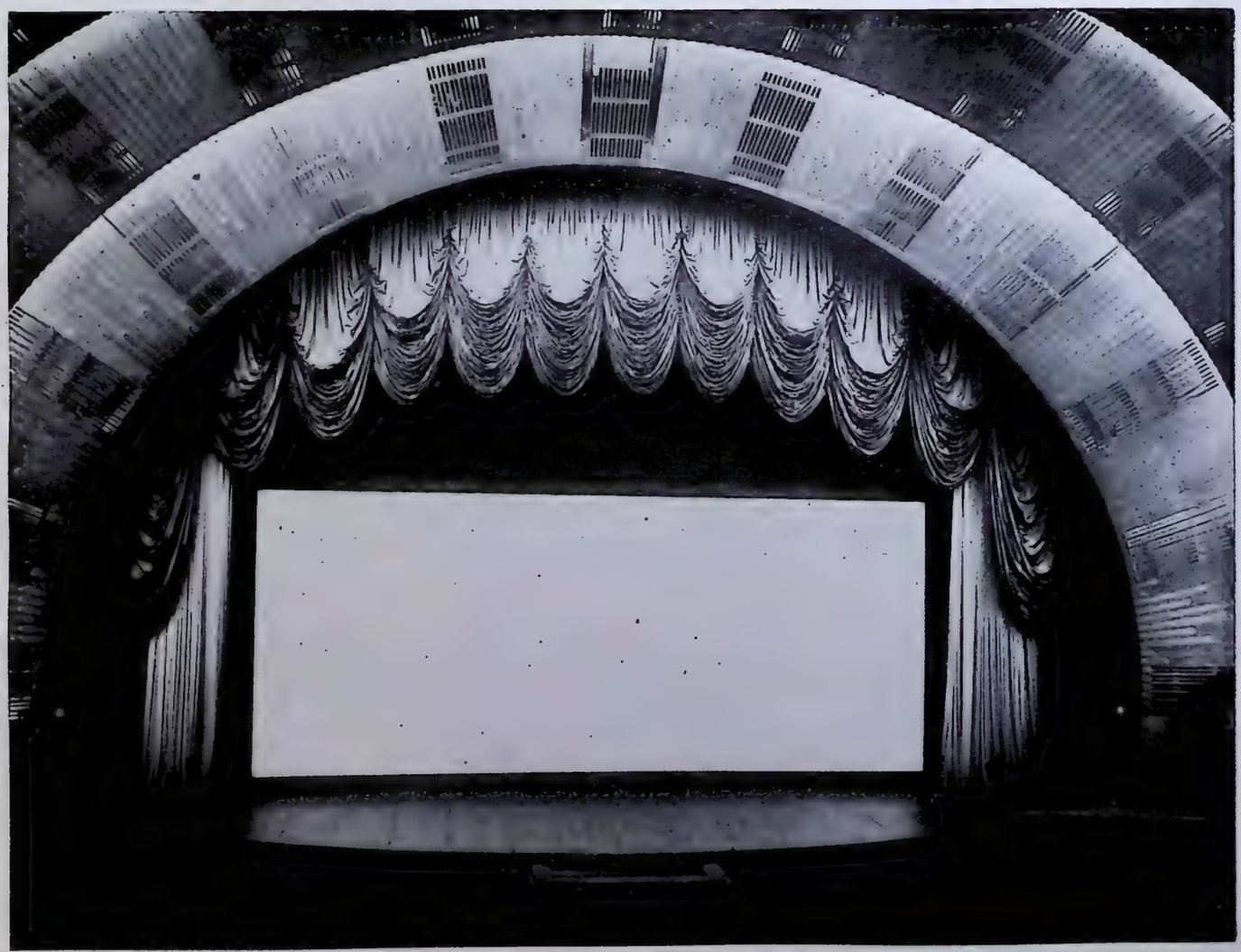
WILLIAMS

The Williams Screen Company is producing an all-purpose screen that has been acclaimed for its excellent light distribution and clear, even reflective surface. The screens are made entirely of plastic, electronically welded to produce unobjectionable seams, which makes it possible to produce sizes up to 55 feet.

The silver finish supplies excellent polarization for 3-D, and the increased reflectivity assures sharp, brilliant pictures for all types of projection.

The solid plastic construction makes the screen extremely tough and permanently flexible.

THE VOCALITE Hi-Lite screen in the Radio City Music Hall, New York City. The screen is said to have light reflection value in excess of 90 per cent.



Astrolite Reflection Theory

Complete Study of the Theory Behind the Development of the Astrolite Screen, and Its Adaptability to the New Systems

By JOHN L. CURTIN
Research Director, Glowmeter Corp.

Reflective type surfaces for use in the projection of motion pictures are classified broadly into three optical categories. Those which spread the reflected light from the projector in all directions and which obey Lambert's Law are called diffusing type reflectors, while projection screens which have mirror-like qualities and obey the law of specular reflection are called specular reflectors. In addition to these two general types, there is a third class of screen surface which combines the principles of both diffusing and specular screens, and it is in this latter or third type of optical surface that the Astrolite screen may be best classified.

BRIEF: ***This article contains much valuable information about that very important subject . . . screens . . . With the wider pictures . . . 3-D . . . and other new projection systems . . . the need for bigger and better screens is quite apparent . . . In order to properly understand the needs of his theatre . . . the exhibitor should know some of the fundamentals behind the construction of motion picture theatre screens . . . The author of this article . . . therefore . . . performs a valuable service by explaining many of these basic facts and theories . . . in a clear and simple fashion . . . The reader will have a much better grasp of the entire subject after reading this feature.***

The most distinguishing feature of the Astrolite screen, and the one which sets it apart from other surfaces, is the fact that it is of a lenticular type. This word, lenticle, is perhaps new to the vocabulary of the motion picture industry, and so deserves some further description. In the sense that it is used in this paper, a lenticle is an embossed or curved small mirror which has the property of spreading the reflected light in a controlled manner uniformly in all directions. The manner in which this function is performed will be the basis for much of the following discussion.

Need for High Efficiency Surface

The Astrolite projection surface was first presented to the exhibitor at a time when the industry was confronted with two new concepts of motion picture display, each requiring a special type screen. The first of these processes was CinemaScope with its 2.55 to 1 aspect ratio. Since the screen area was almost doubled over the conventional 1.33 to 1 ratio, means were sought whereby additional illumination could be obtained, either by using higher wattage projectors or by developing new high intensity carbons for the arcs. Both of these methods met with some success. However, the ultimate solution came with the great increase in efficiency of the screen surface itself. Not only was it required that the brightness of the image by maintained along the center of the theatre, but also from side to side with no appreciable dropping off in image brightness at either extreme side of the theatre. Only a lenticular surface with its built-in optics, such as Astrolite, could perform such a function and thereby enhance the artistic value of CinemaScope productions.

The second process which demanded a special type screen was the 3-D concept of picture presentation. Here two problems presented themselves insofar as the type of screen surface was concerned. The first of these was the necessity of using a metallic reflector to preserve the state of polarization of the two beams and secondly, a method to combat the high loss of efficiency resulting from the means required to separate the two images. Calculations predict that a perfect filter will allow 50 per cent transmission and the viewer will permit only 50

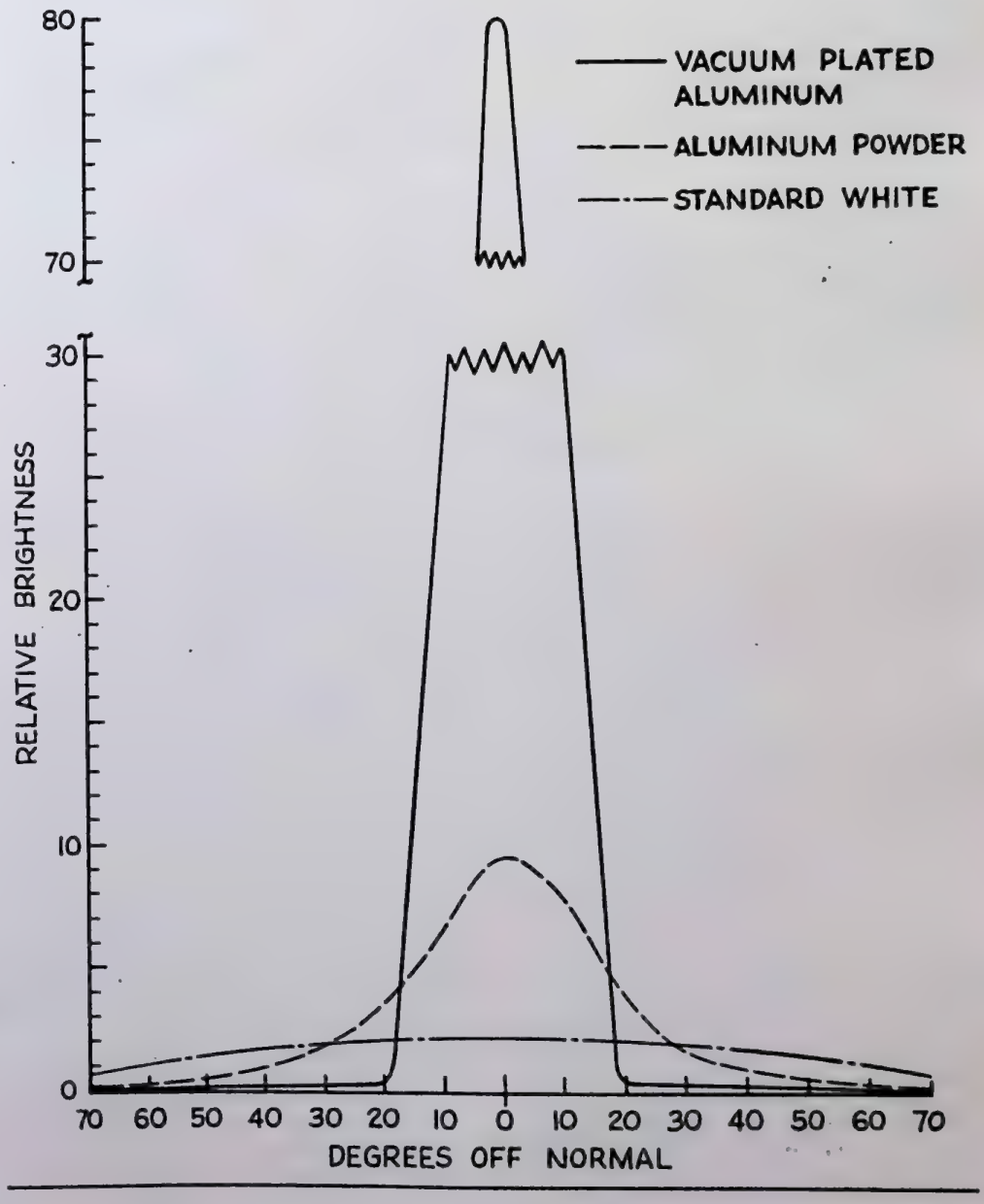


FIGURE 1 is a photometric comparison of light reflectivity between a vacuum coated sample and one coated in a plastic carrier.

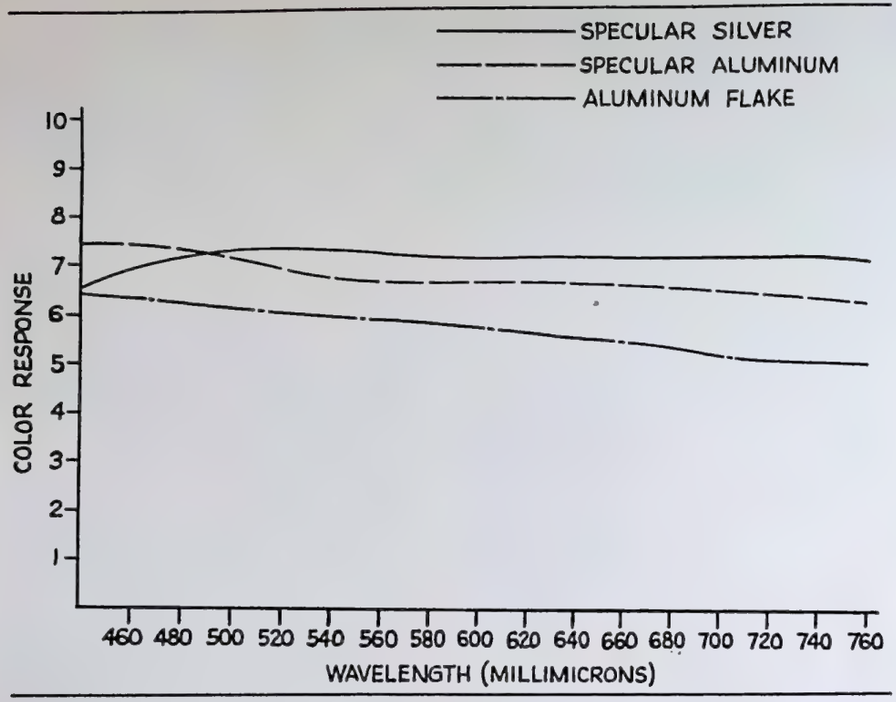


FIGURE 2 is a diagram which illustrates the color response of various reflecting surfaces.

per cent of this energy to reach the eye. Consequently, a reflecting surface must be utilized wherein at least part of this 75 per cent loss is compensated for by a high efficiency reflector.

In this regard, it may be pointed out that a compromise exists between the so-called polarization defect and screen brightness. Obviously, if the defect or light leakage is too severe, eye strain and a feeling of general discomfort will result after being exposed to such a condition. On the other hand, if the screen brightness falls below the minimum accepted value at any seat in the theatre, eye strain and fatigue will again result. Therefore, the best all-purpose screen is one which most effectively preserves the polarization characteristics while returning to the audience the highest amount of projected energy.

Benefits Derived from Lenticular Design

The development of the Astrolite surface historically took place in two steps. As a basis for the optimum control and utilization of the available energy, many possible designs for the lenticles were studied until one particular pattern was evolved which gave extremely promising results. Screens manufactured with this pattern were trademarked as Magniglow surfaces, since they had the capacity to reject unwanted light and produced sharp borders within which the viewer had to be located in order to see the image on the entire screen.

In order to decrease the sharpness of the borders of the field of view for indoor presentations, a special controlled diffusion process was applied to the Magniglow surface. This product resulted in what is now called the Astrolite screen. So it is seen that the Astrolite surface is actually a combination of two processes and to clarify the structure of the component parts, the Magniglow characteristics first will be discussed and then the combination of the two theories will be presented.

Benefits of Lenticular Surface

Among the benefits derived from the use of a lenticular surface are the following features:

1. **Optimum Return of Energy**—It is only with a lenticular pattern that a mirror-like reflecting surface can be used without danger of "hot spots" being produced. These brightness variations result from uncontrolled reflection surfaces wherein the incident energy is not properly spread over a predetermined viewing field.

The question of the use of any particular type of metal depends, in part, upon the color response of this metal over the visible wave length region extending from 400 to 750 millimicrons. Silver or aluminum prepared by a vacuum plating process yield the highest reflectivity of any of the common metals while maintaining a uniform spectral sensitivity. This, however, does not imply that these same metals, when deposited on a supporting surface by other means, such as by spraying or roll coating aluminum flake, will give the same characteristics. With a flake mixed in a plastic carrier, there are unavoidable interstices between particles which become sources of light absorption in addition to the manifestation of color differences. Figure 1 illustrates the comparison of surface brightness between a vacuum plated, non-embossed aluminum sample and an aluminum surface which has been coated with a flake suspended in a plastic carrier. These curves clearly depict the differences which exist between specular and diffused reflection.

The next series of curves taken on a Beckman Quartz Spectrophotometer illustrate the color response of a vacuum plated silver, aluminum and a flake type aluminum surface. In order to interpret these curves, the relative percentage of reflection is not as important as the flatness of the line in the 450 to 750 millimicron range of wave lengths. The more regular and flat slopes indicate a color reflectivity which is uniform throughout the color spectrum, this condition, of course, being most desirable for the projection of Technicolor pictures.

2. **Control of Fields**—Another basic difference between the Maniglow screen, which has a high specular reflectance, and a diffusing type screen lies in the fact that a Magniglow screen has controlled fields of observation. By this term is meant the solid angle subtended at a point on the screen surface, yielding a rectangular volume of space inside of which the image is perceived. The resulting reflecting energy under such conditions is returned in a volume of space and thus is concentrated where it can serve a useful purpose. All reflection into undesired areas is therefore eliminated, thus yielding a more efficient screen surface.

Since the volume of space into which the returned energy is beamed may be controlled by the optical design of the screen surface, the image for a given projector intensity may be regulated as to brightness by the volume of space into which the image is maintained. In this connection it is well to emphasize the fact that brightness measurements made on this screen must be carried out over the entire viewing area, instead of as in the case of the diffusion type screen measuring brightness on the axis of reflection.

3. **Uniformity of Field of Observation**—Another basic difference between uncontrolled diffusion type screens and the Magniglow screen is the uniformity of brilliance over the useable viewing angle. It is well-known that diffusion type screens possess maximum brilliance on the axis of projection and then drop off rapidly in intensity when the viewer exceeds plus or minus 20 degrees in the lateral direction. An optically controlled surface such as the Magniglow screen reflects energy into a volume of space in a uniform manner such that the screen brilliance maintains a uniform quality to the edge of the desired field. This condition exists both in the lateral and vertical directions so that the entire viewing area receives the same brightness value.

4. **Resolving Power of the Screen**—Assuming that the normal eye can resolve two images separated by a given distance from the observer, the Magniglow screen possesses in its design a fusion principle wherein all the optical elements appear to be combined to the viewer's eye and thus form a continuous imaging surface. Depending on the use to which this screen is placed the resolution factor of the size of the optical elements may be varied to yield a measure of control of screen brightness.

5. **Ambient Light Characteristics**—As a result of maintaining fixed boundaries for the field of observation such screens will resist ambient light inci-

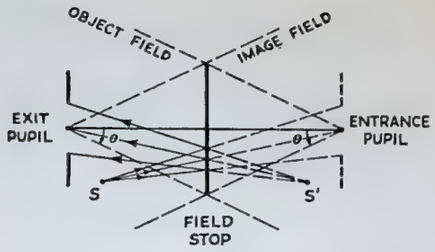


FIGURE 3 is a diagram which is an illustration of the fields of observation of a plane mirror.

dent on the surface from without the field. This effect is most beneficial when the screen must be located in positions where it is impossible to eliminate completely extraneous light. Thus, for example, the classroom and the outdoor theatre use of this screen will yield vastly superior results than will a diffusing type surface, because of the preservation of better contrast values over the entire screen surface.

THEORY OF MAGNIGLOW SCREEN DESIGN

The design of a reflecting type Magniglow screen assumes that specular surfaces are involved and that consequently the theories which pertain to the surfaces may be applied to this problem. Let us, for a moment, consider what happens when we look into a plane mirror. First of all, it is noticed that an image is formed seemingly as far in back of the mirror as we stand in front. Now, as we move to the right, our image correspondingly moves to the right and this motion may continue until our sight is impeded by the presence of the mirror boundary. The observer's eye then perceives the image disappearing past this boundary until the line of sight can not longer pick up the reflected light.

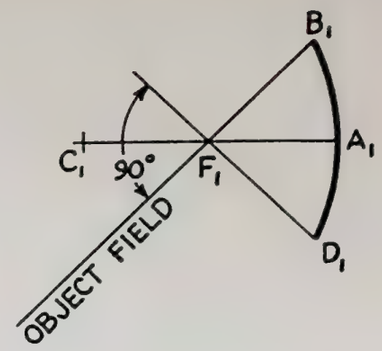
Another observation which can be made is that the distance of the eye from the mirror has a bearing on the mangitude of the lateral displacement which can be allowed before the image disappears at the boundary. If the viewer's eye is moved closer to the plane mirror, the lateral displacement will be greater and still retain the image within the mirror boundary.

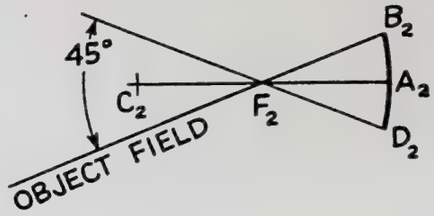
From a study of the properties of reflecting surfaces, several rules have been formulated whereby it is possible to predict the behavior of these surfaces under different conditions of observations. It has been stated that the edge of the mirror imposes restrictions on the field of view and this, then, is the field stop of the system. Likewise, it has been stated that the proximity of the eye to the plane mirror determines in part the field of observation. The angle that the pupil of the observer's eye makes with this mirror boundary is called the "exit pupil" and determines the volume of space within which the image must lie in order to be seen by the observer. The entrance pupil of such a reflecting system is the virtual image of the observer's eye and the volume of space encompassed by drawing rays from the entrance pupil point to the field stop determine the boundaries within which the object must reside in order to be seen by the observer. Perhaps the pictorial presentation of a plane mirror described in terms of the field stop, entrance and exit pupils, as shown in Figure 3, will facilitate the understanding of these concepts.

There is one additional concept which must be covered before the detailed theory of Astrolite reflection may be presented. This factor involves curved mirrors, either concave or convex in nature, and the location of their focal points for imaging purposes. If light consisting of parallel rays or bundles are allowed to impinge on a concave mirror, it is noticed that upon reflection all these rays meet at the focal point of the system. Again, as with the plane mirror, if we move in a lateral direction, say to the right, the image formed by the mirror appears to move to the left. Similarly, as we analyze the relative motion of a virtual image formed by a convex mirror, the image appears to move in the same direction as the observer. Illustrations of these two cases are shown in Figure 4. As a final observation, which can be made in a qualitative fashion, it is recognized that with a curved mirror, the image appears to move at a slower rate than does a corresponding image viewed on a plane mirror.

Illustration of the Field Concept for a Concave Mirror

Consider a concave mirror which has a radius of curvature of one inch. Then, since it is assumed that the incident light is composed of a parallel beam, the image will be formed at the focal point which in this case is one-half the radius of curvature. If it is desired to obtain a viewing angle of 90 degrees as is shown in Figure 5, the element diameter must be approximately 0.84 inch. To obtain a vertical angle of 45





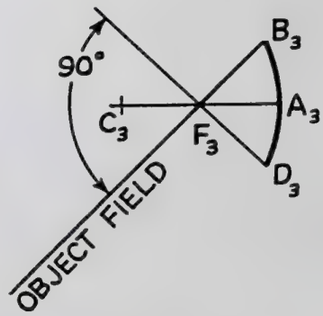
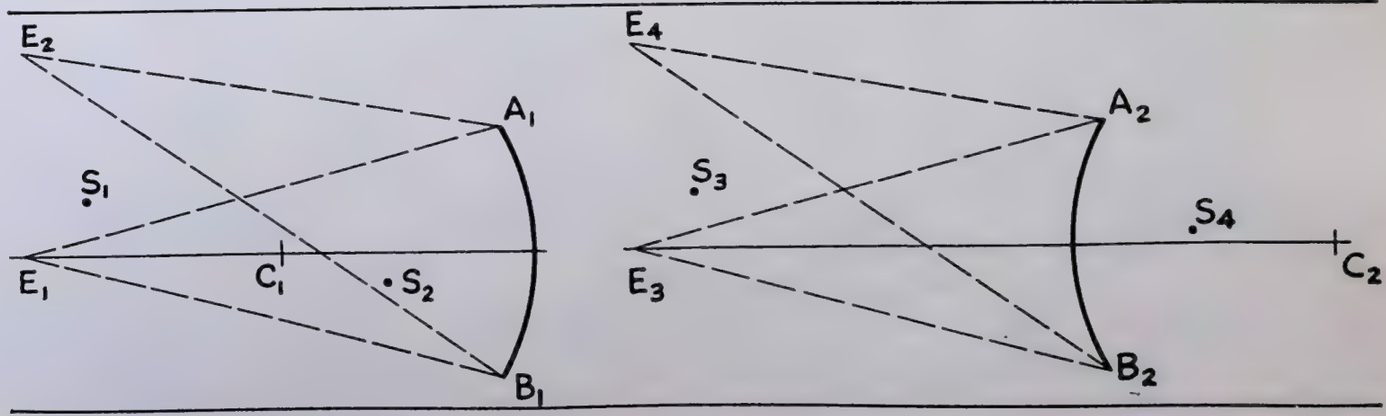


FIGURE 5 illustrates methods of obtaining specific fields of view with concave mirrors.

FIGURE 4 helps to show the relative motion of images formed by a convex and concave mirror.



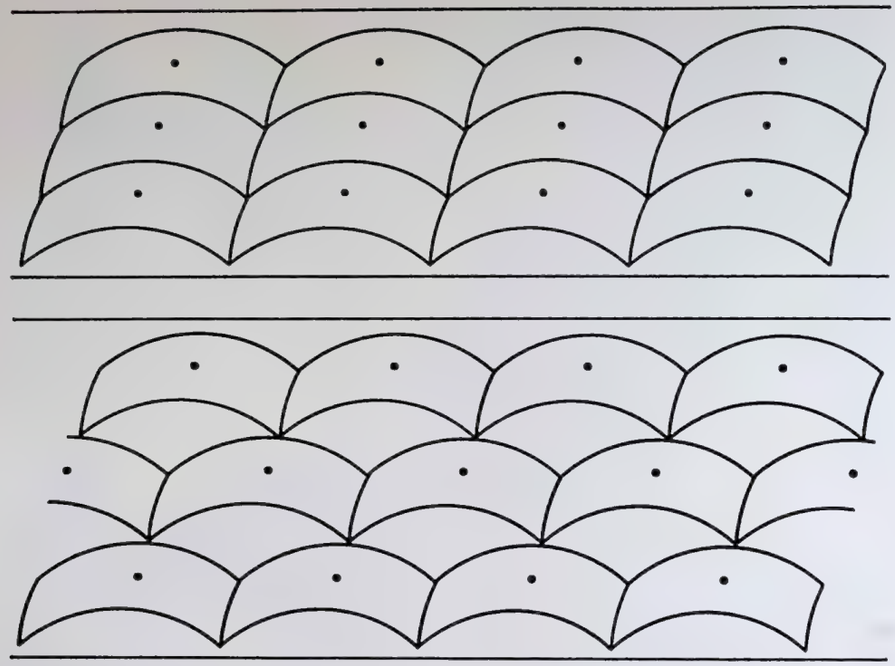


FIGURE 6 (top, left) shows image formation with adjoining convex mirrors. Figure 7 (bottom, left) the arrangement of staggered convex elements.

degrees, all that is required is to decrease the element diameter to approximately 0.40 inch as shown in the second drawing.

Obviously, it is at the disposal of the designer to select a different combination of element diameter and curvature to obtain the same viewing field. This concept is illustrated in the third drawing of Figure 5, where the angle is 90 degrees but the radius of curvature is 0.625 inch and the element diameter is 0.53 inch. It must be remembered that when the projection beam is directed along the axis of the mirror, the image is formed on the optical axis; however, if the projection is made at an angle to the mirror's optical axis, then the image is displaced and will produce a non-symmetry in viewing angle. As is generally the case, the projector is sufficiently distant from the screen surface so that the beam does not strike the reflector at a large angle. Of course, a viewer looking at the surface can place himself in such a position that he is out of the field for part of the screen and in this case it will be noticed that the screen appears dark due to the absence of reflected light to the observer's eye.

FIGURE 8 illustrates undesirable dead space between series of concave and convex lenticles.

Proper Selection of Lenticles

Up to this point the discussion has concerned itself with the manner in which the desired field of observation is obtained and some of the properties of curved mirrors. Now it will be shown that there are many possible combinations of mirrors which give some of the lenticular effects, with but one particular pattern possessing optimum characteristics. Let us select elements of a convex nature arranged as illustrated in Figure 6, with the projector illuminating the screen in a fashion so that the visual images are located in the center of each element; any motion of the observer will apparently cause the images to move with this observer. Again, the curvature and diameter of the elements yield a controlled field of observation. Since the reflecting surface described here is strictly specular with no diffusion entering, the primary disadvantage of utilizing this design for a Magniglow screen is that the image boundaries contain "dead space," or space which is optically inactive. Ridges formed by the surface discontinuity at the field stop result in "hot spots" produced for certain viewing angles. A person studying such a screen would notice that bright points of light or scintillations would occur and produce uneven light distribution.

Another consideration that must be given serious thought when possible designs are being considered is the screen's resolution characteristics. It is understandable that some upper limit must be placed on the element diameter; otherwise, a screen of coarse texture would result. As a basis for selecting the optimum size of each lenticle, it is assumed that the average eye can detect

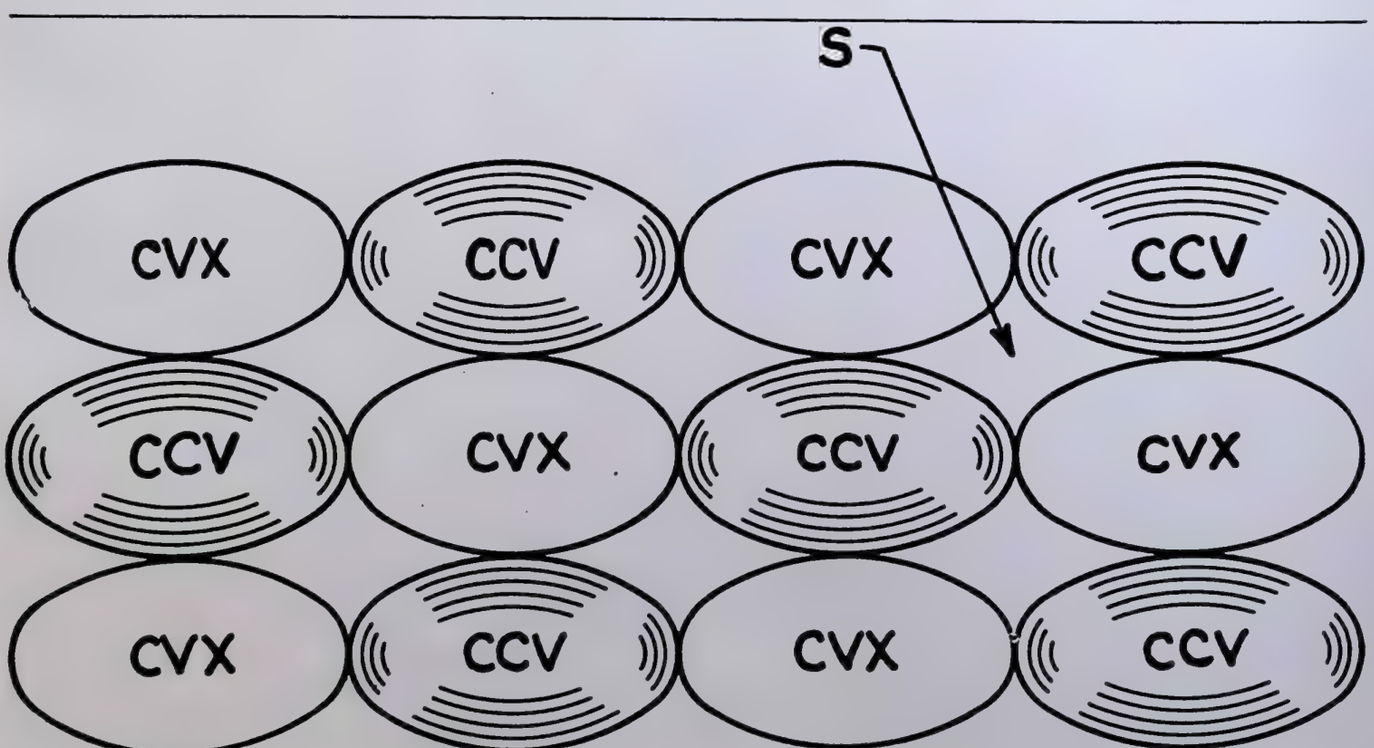
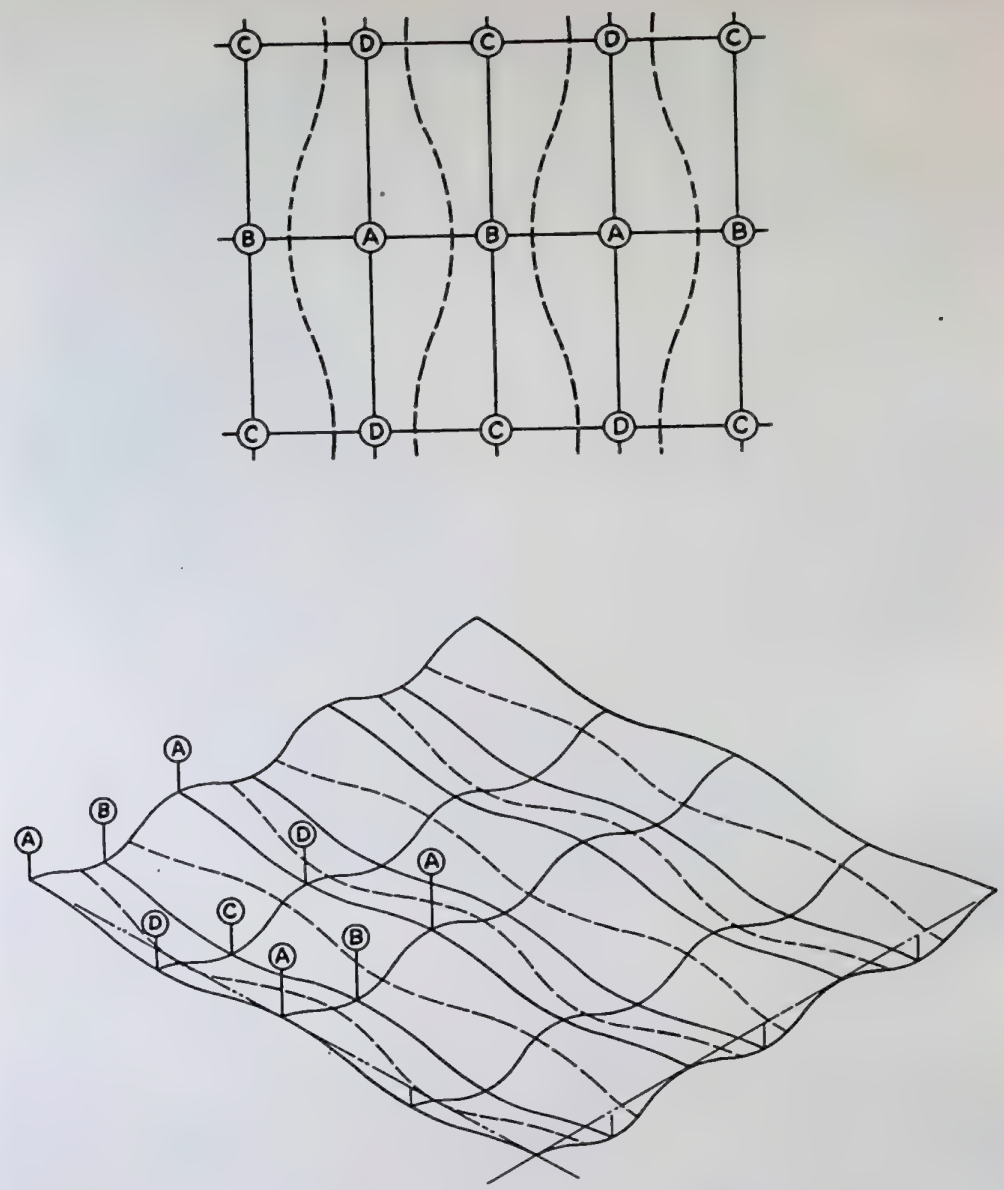


FIGURE 9 is a topographical map illustrating flow pattern of the Magniglow screen design.



an angular separation of 70 seconds between distant objects. If the adjacent images formed by the mirrors exceed this separation for a given viewing distance, then each individual image will be seen and the projected image texture will lack definition.

Returning to a study of Figure 6, the blending of images is not arranged in an optimum manner, since the lateral image displacement is greater than the vertical separation between consecutive images.

To counteract this defect, the elements may be staggered with images appearing as shown in Figure 7. The resolution is improved with this arrangement of elements; however, there becomes evident another defect—that of sharp discontinuities in the flow pattern. Performing an embossing operation on such a pattern results in structural weaknesses and uncontrolled areas of stray reflectivity.

Another possible screen design would incorporate alternate concave and convex surfaces in an attempt to reduce "dead space," i.e. space on the screen surface which does not possess controlled convolutions. As is seen from Figure 8, the area marked "s" may be considered "dead space" if no attempt is made to flow the pattern from element to element. If an attempt is made to blend the curves, a saddle pattern results which of necessity will have different fields of observation than will the computed alternate concaves and convexes.

Controls Entire Surface

The design which controls the entire surface of the screen with none of the defects mentioned above will now be the topic of discussion. This screen has a designed lateral angle of 100 degrees and a vertical angle of 50 degrees. For any other field of observation, the shape of the pattern will change but the basic flow characteristics will remain unchanged. The size of the largest element was selected after consideration was given to the resolving power of the eye and the relative motion of the images.

The topographical map of Figure 9 illustrates the flow pattern of the Magniglow screen. Solid lines on this map denote the curvatures which occur when progressing in any direction. The dotted lines portray the field stops for the various elements. A second view of these elements with the appropriate stops show that in the vertical direction, each element has a diameter of 0.0208 inch. The horizontal diameters vary from 0.008 to 0.0166 inch, to compensate for varying radii. If a vertical line such as that represented by BCB in the drawing is selected, it is noticed that the elements alternate in curvature along this plane so that a convex, concave, convex pattern is maintained. The elements located at right angles to this plane such as those located at ABA and DCD determine the horizontal field and are all concave in nature while the adjacent row of elements are all convex. As a result of these curvatures, the vertical field of observation is maintained by alternating convex and concave elements while the horizontal field is composed of vertical rows of concave elements adjacent on either side to vertical rows of convex elements.

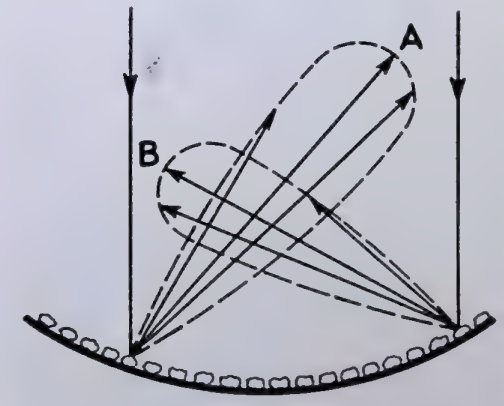
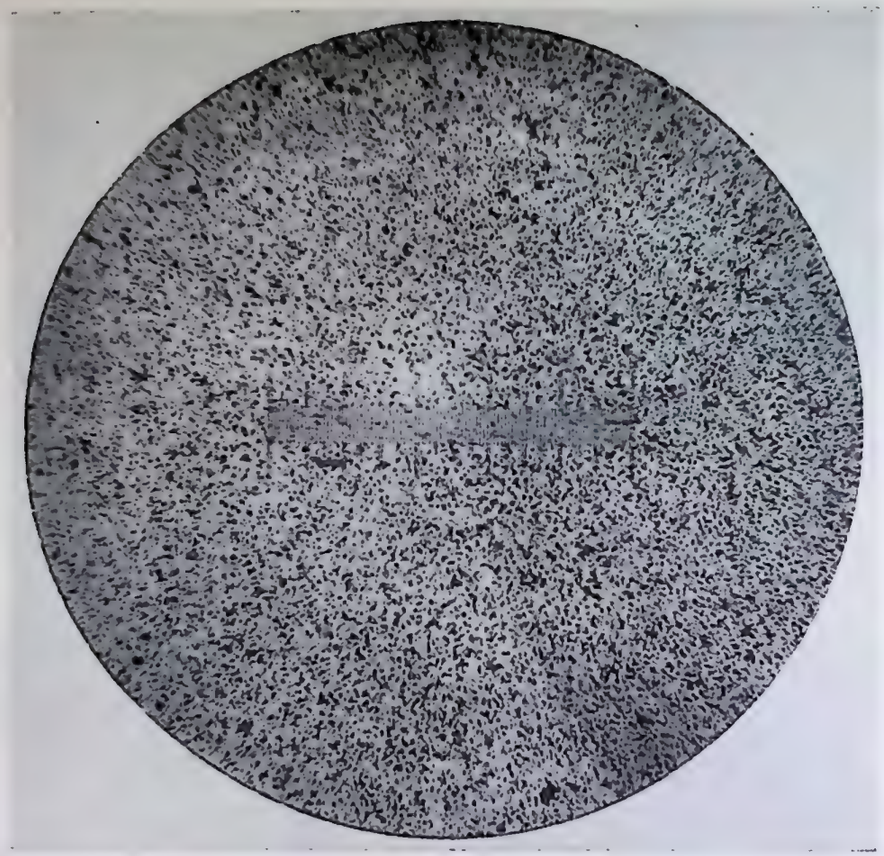


FIGURE 10 is an illustration of the manner in which the controlled diffusion is accomplished.

The last observation to make with reference to the topographical drawing is that of the various surface levels of the elements. It is for this reason that the sagitta or arc depths are of importance. So that no part of the surface is left undesigned, the depths of a curve in one direction must be adjusted to meet the depths of the curve running at right angles to it and at the same time retain the field of view desired. Thus, the figure shows reference levels labeled A to D corresponding to the elevation levels of the various elements.

Controlled Diffusion Type Surface

The physical environment of the indoor theatre necessitated a reflective surface whose basic properties consisted of those described above and in addition, a mellowness and uniform drop-off in brightness at the borders of the field of observation. A fully specular, lenticular screen would give uniform light distribution and would serve well to restrict viewing angles. However, since there is no way to predetermine the most desirable viewing area for all theatres, an arrangement of controlled light distribution was developed whereby under any existing condition the field uniformity could be preserved. The method of performing this function consists of coating the reflective surface of the screen with a plastic containing minute granules of a diffusing agent. These particles may be, for example, glass, silicon dioxide powder, or any material which when projected upon will cause a light scattering to take





place. Of course, certain restrictions on thickness of the layer, particle size compared to lenticle size and composition for the retention of 3-D characteristics must be evaluated before a selection is made of a particular substance.

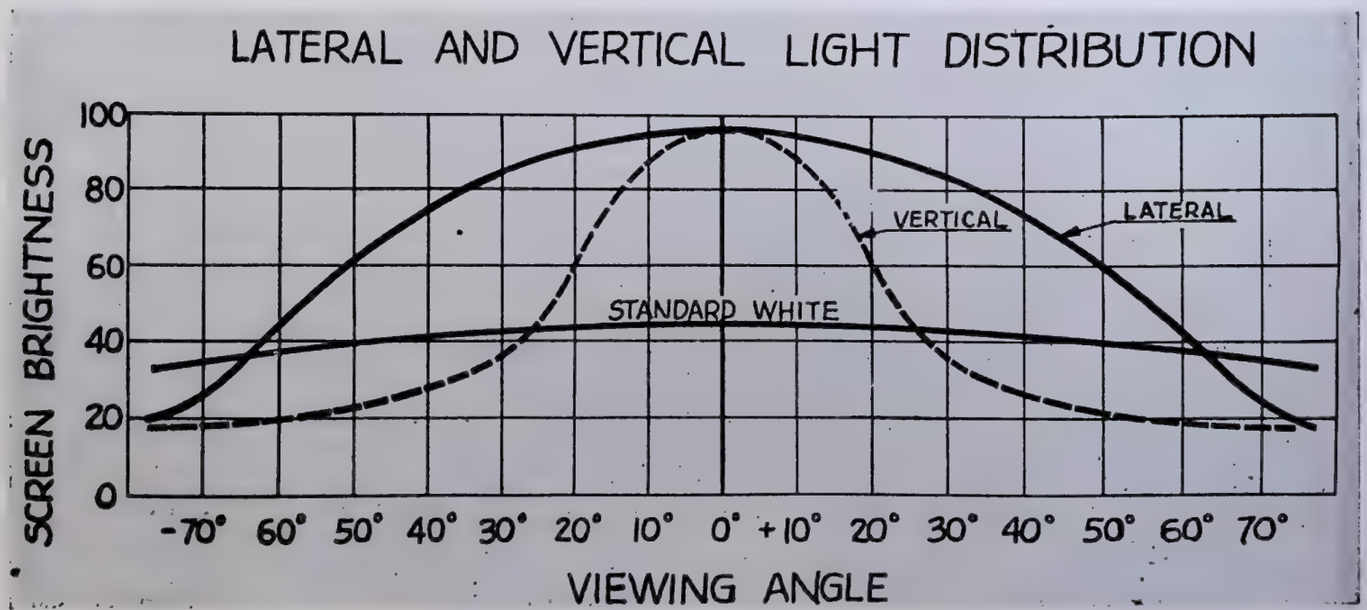
An element containing such a coating is illustrated in Figure 10. This may be regarded as one segment of the Astrolite screen. It is noticed from a comparison of this figure with a wholly specular element that the uniformity of reflectivity is still present, this state being indicated by the length of the reflected rays A and B. But, in addition to these major rays, a series of less intense reflections are created by the particles and these diverging beams tend to spread out the light energy past the normal optical boundary of the element.

Figure 11 is a shadowgraph showing the distribution of these fine particles when viewed under high magnification. An upper limit on the magnitude of any particle is approximately 0.1 that of the size of the lenticle. This, of course, is easily understood when consideration is given to the effects produced by a particle of the same order of magnitude as the element. In such a case, the lenticle curvature would have little influence on the distribution of reflected light, and consequently the entire screen would approximate a completely diffusing surface. Figure 12 shows the enlarged section of a finished screen and the embossing details which spread the light uniformity throughout the theatre.

CONCLUSION

The test of whether or not the above theories work out in practice is to perform a photometric analysis on a finished sample of Astrolite. If the controlled diffusion principle is operating as one would expect, the brightness gain should remain relatively flat when leaving the axis in a lateral direction and then gradually taper off reaching a value of standard white. As is shown in Figure 13, this is actually the situation that exists with Astrolite. The magnitude of the brightness gain and the angular spread of light may be controlled by varying the embossing techniques and this factor affords a means whereby any desired type screen may be produced.

FIGURE 11 (above, left) is an enlargement of a screen section to portray the particle distribution. Figure 12 (above, right) is an enlargement of screen section to show lenticular pattern. Figure 13 (below) is a chart showing the brightness gains of a sample Astrolite motion picture screen.



Today's Rectifier for Tomorrow's Arc

An Analysis of the Design, Construction and Operation of a Selenium Rectifier Developed With Features for the Future

By M. D. Faige
President, Norpat Sales Company
American Selectifier Div.

BRIEF: ***It is only natural that when there is a great demand for more light on the screen of a motion picture theatre . . . as there is today as a result of the acceptance of the wide screen . . . that all of the equipment designed to furnish that light be adapted . . . and improved to meet this demand . . . This article describes a new selenium rectifier which includes many of the features in its design . . . and operation . . . necessary in the modern projection booth.***

The author . . . who has spent many years in this phase of motion picture operation . . . gives a detailed description of the various parts of this rectifier . . . and discusses why each of the features were designed as they were.

This article should be of great assistance to the theatre operator who has been seeking more information about the selenium type of rectifier . . . which appears to be increasing in popularity.

Obviously, the new enlarged picture requires more total light supplied by a source of direct current which has a greater output than the arc lamp power supply of the past. Foreseeing the now proven need and lack of sufficient source for such units, American Selectifier division designed two types of selenium rectifiers to meet today's requirements, with an eye to the even larger lamps of the future.

Starting with the assumption that a tremendous safety factor and far lower than present ripple-content power supplies would be required in the future, it was decided that the exhibitor must be protected by built-in features in the rectifier he buys now to meet the expected demands of tomorrow.

The former copper-oxide and magnesium-copper-sulphate rectifiers in use since 1933, when the writer saw the General Electric unit in a Lynn, Mass., theatre, did an efficient job under old standards, and most can be rebuilt by replacing the stacks with selenium stacks and thereby have more output than when they were new. However, we are getting ahead of ourselves. First, what is a "metal" rectifier, and why should it be used instead of other types of direct current power supplies?

Why Metal Rectifiers

Consisting essentially of a cabinet housing a line transformer, a series of selenium rectifier stacks, a forced cooling system and some means of controling the output, the system seems extremely simple, and, in its installation, operation, and maintenance, it actually is. The Selectifier is so constructed, but with ramifications to assure uninterrupted efficient performance.

Important Features of Rectifiers

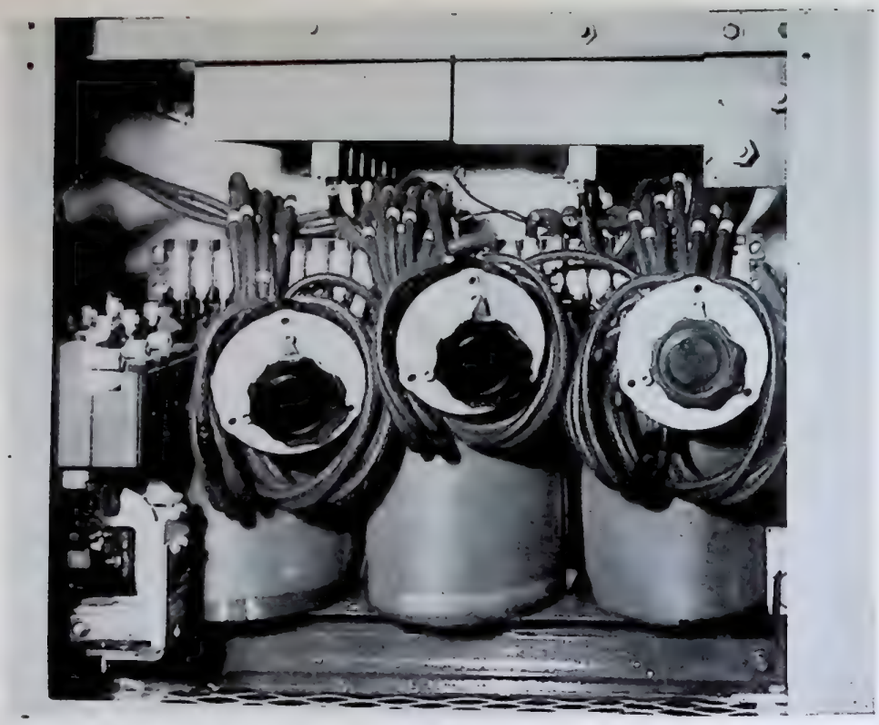
Our engineers knew the conditions which an arc rectifier must meet—high room temperature, abrupt changes in load, accidental overloads, and corrosive atmosphere. Our engineers knew, too, that the power supply must be easy to install, operate, and maintain. Here are some of the features which are engineered into Selectifiers to make sure that they will meet these demands:

Custom-built selenium stacks assembled by hand from pre-tested selenium plates. This extra operation makes it possible to match the resistance characteristics of the plates in each stack. The result is a stack which runs cooler, which can stand a greater overload, and one which has no "weak spot" where failure can start.

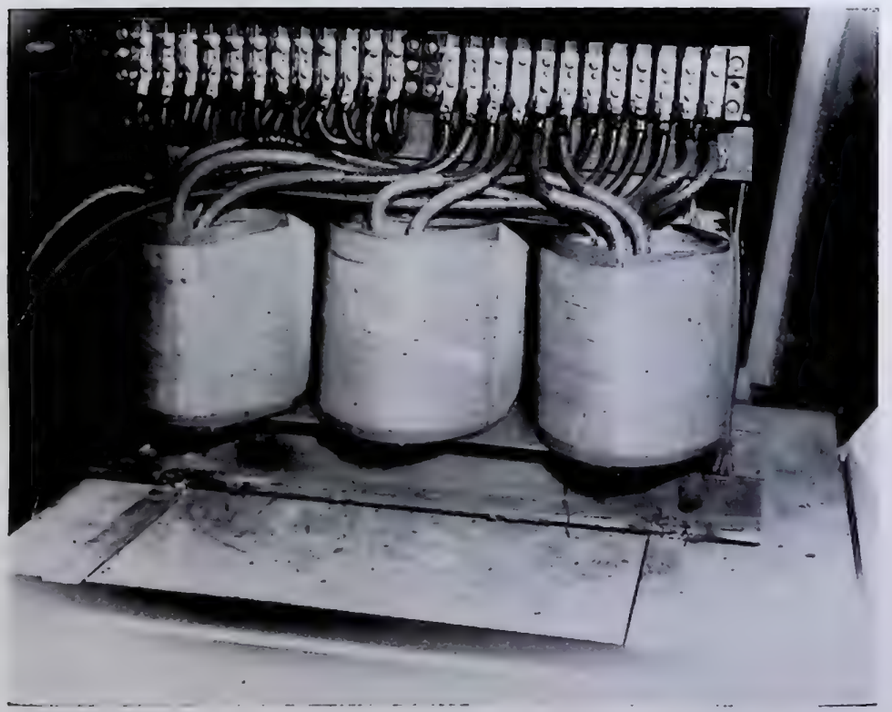
An exclusive corrosion-proofing process. Each stack is given a multiple coat of a special corrosion-resistant enamel, applied by our own process, and then sprayed with moisture and fungus-proof varnish.



THIS selenium rectifier is so constructed that it can furnish a clear flickerless picture for standard films and the wide screen film systems.



NOTE the over-sized components (above). The rectifier has thumb-thick glass insulation. The photo (below) offers a view of the powerful 290 pound transformer ready to be installed in the rectifier.



Effective Cooling. In these scientifically arranged forced-draft models, the stack size and cooling capacity are conservatively designed, permitting continuous full-load operation at any rectifier room temperature normally encountered.

Rugged Transformer

There is plenty of reserve power in the Class B-construction transformers. They will deliver their full rated output continuously, at high efficiency and power factor. Insulated and vacuum-impregnated with heat and corrosion-proof materials, these transformers have practically unlimited life.

Built-in protective circuits and controls guard against dangerous overloads and stack over-heating. The unusual use of a three-pole magnetic contractor switch serves to completely isolate the equipment from the AC line; a safety precaution for the projectionist.

All that is necessary to install a Selectifier is to connect it to the AC line and to the DC arc, and the rectifier is ready to go at the touch of a button. Outputs of different units are easily combined in series or parallel for greater capacity, if ever needed.

Ventilation

The impeller fan is mounted at the top, with cooling air feeding in from the side openings. The top is closed so that it does not matter if it is covered with storage items, as frequently occurs. The impeller blows cold clean air down over the stacks, in scientifically designed distribution, past the heavy transformers in the base section, and out through the base. No dirt is drawn in off the floor of the room, or can fill in from above.

All units are designed for continuous duty, to have long life and to be dependable in use, with the reserve capacity and ability to sustain temporary current overloads, should emergencies arise.

Arc current and voltages are easily controlled by top changing switches mounted on the unit, and accessible to the operator. Adjustments may be made while the lamp is on. In addition, because of the single moving part, there is almost a complete lack of maintenace, and any that is required is simple and infrequent.

Arc Voltage Control

To cure incorrect arc voltages, one of the most persistent causes of complaint concerning arc operation—seldom recognized as the actual cause—the voltage supplying the arc has been made variable with a high and low range. In addition, the usual input line voltage taps and also three heavy-duty tapped switches are mounted on the front panel, to make possible the in-use flexibility of adjustment which is required, due to the changing line voltages, during the program day. A movement of wrist gives the output desired .

Deluxe Features

Deluxe type units have many added features not found in the standard models. For instance, an alarm warning device is incorporated as an integral part of the assembly, and functions when the operating temperature of the rectifying elements exceeds a pre-determined, chosen maximum point. The alarm only serves to warn the operator, but in no way interrupts the power.

Ripple output of "50,000 hour" Selectifiers is brought to a minimum by means of a special rectifying circuit whose construction is more complicated and costly, but allows for a 12-phase ripple, and therefore, truly flickerless light on the screen.

Rectifying element areas are increased (more stacks), which in turn increases the life and efficiency of the unit as compared to standard models. Enclosures for these units are made of steel, welded construction, and are attractive in appearance. Efficiency of these engineered units run as high as 85 per cent, resulting considerable savings in power.

The lack of moving parts, except for the impeller fan, makes the unit extremely quiet in operation as compared to motor generators.

Selectifier arc units are made in ranges of 50–70 amperes, 70–90, 90–115, 110–140, 150–190, and 210–250 amperes, for 3-phase lines. For single phase a new model has added choke filter circuits to obtain normal low ripple output.

Effects of Stray Light on Picture Quality*

A Comprehensive Study of the Influence of Stray Light on The Quality of Indoor and of Drive-In Projected Pictures

By Raymond L. Estes
Eastman Kodak Company Film Testing Division

BRIEF: ***Whenever stray light causes a severe loss in the brilliance . . . beauty . . . and detail of a projected picture . . . unfavorable audience reaction can be expected—whether it be in regular or drive-in theatres . . . auditoriums . . . or classrooms . . . A study of the basic effects of stray light and their relation to picture quality is discussed in this paper . . . together with methods of controlling the important factors involved . . . In addition . . . results of a special screen-brightness and stray-light survey of drive-in and regular theatres in Rochester are presented . . . These data emphasize that stray light is most serious when screen brightness is below standard . . . In this situation, the harmful effects can be minimized by increasing the level of screen brightness; usually this can be accomplished by precise adjustment and careful maintenance of the equipment.***

Whenever pictures are projected on a screen, the brightness range of the screen image from highlight to shadow is established by two limits:

First — The brightness limit for the highlight is controlled by the light output of the projector in combination with the size and reflection qualities of the screen.

Second — The limit of darkness is established for any projection screen by its stray-light level. The deep shadow region in the screen image may approach, but certainly cannot be darker than, this lower limit set by the stray-light level.

In one form or another, it is generally recognized that stray light is a problem. Four instances of this are:

1. A U. S. Navy technician has said, "When a full Bermuda moon rises to flood out our outdoor screen at Hamilton, we're in trouble. Such moons were obviously made for romance and not for the showing of open-air movies."

2. The Committee on Non-Theatrical Equipment of the SMPE in 1941 reported, "*Good Tonal Quality* in the projected picture is impossible if the room in which it is being viewed is not adequately darkened."[1]

3. The National Educational Association stated in a recent audio-visual publication, "*Light Control* is one of the most important of the special problems facing school planners who are designing classrooms to meet the needs of modern education."[2]

4. A projectionist at a neighborhood theatre recently stated that they were forced to raise the level of illumination in their auditorium in order to prevent rowdyism.

Therefore, wherever pictures are projected, stray light may become a problem, be it *classroom*, *drive-in*, or *theatre* screen.

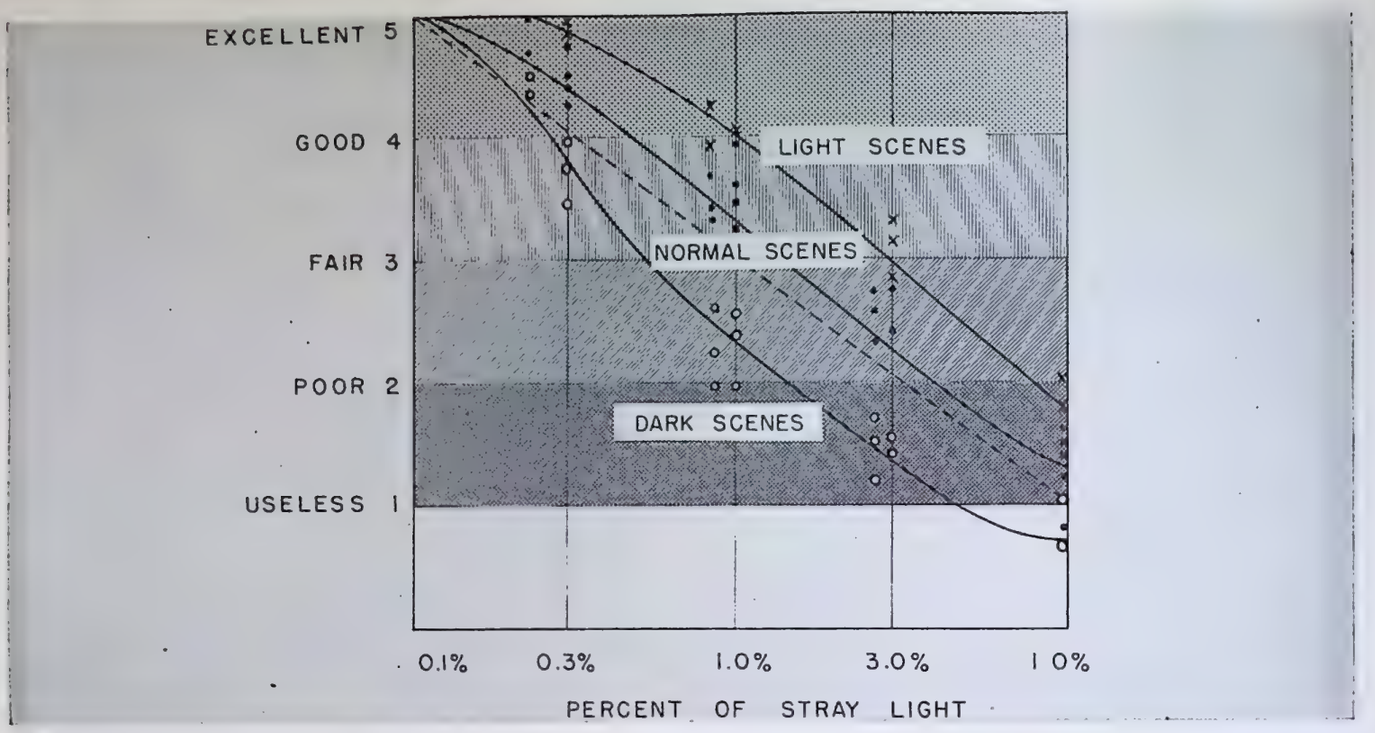
STRAY LIGHT

For the purpose of this paper, stray light is defined as the brightness in footlamberts (ft-L) produced on a projection screen by any unwanted, non-image-forming illumination that may be superimposed upon the projection screen image. Therefore, the maximum possible tonal range for any screen image from highlight to shadow will be contained between these two limits: the screen brightness and the stray-light brightness. Generally speaking, the greater

Most of this article has been taken from a paper on the same subject which appeared in the Journal of SMPTE, Volume 61, Part II, pp. 257-272, August, 1953, through special permission granted by the Editor.



IT IS IMPORTANT that fine theatres, such as the Fairmont, Cleveland, preserve the quality of the picture shown, by controlling stray light factors.



the difference between these limits, the better will be the conditions for obtaining good quality on the projection screen. Whenever these limits are less than 300:1, picture quality for normal density prints will begin to change. A decrease in these limits to less than 30:1 results in almost total degradation of the screen image. For these last conditions, you may rightly question the visual value of any motion picture for telling a story or educating a group of people.

Data in Figure 1 show how 16 observers judged the picture quality of several light, normal, and dark 35mm motion picture scenes as they were viewed at various percentage levels of stray-light brightness. Judging was done by numbers which represented the various quality classifications noted on the left side of the graph.

5-4	represents	excellent to good	quality
4-3	"	good to fair	"
3-2	"	fair to poor	"
2-1	"	poor to useless	"

The classification of *light*, *normal*, and *dark* scenes is the result of analyzing data from many motion picture prints, both black and white and color, which were selected at random over the last five years. The majority of the scenes examined were obtained from actual 35mm theatre release prints, representing films from many differnt studios. Measurements were made on all these prints to obtain data concerning the maximum density, minimum density, face density, and average density which was used as a further guide in classifying the special scenes selected for the stray-light judgings. The results of these measurements were later compared with those reported by C. M. Tuttle in his 1935 paper, "Density Measurements of Release Prints."[2] These recent results indicate that the average projection density of both black-and-white and color prints have increased somewhat

FIGURE 1 shows audience reaction to stray light. Quality rating of projected pictures at various levels of stray light by 16 viewers twice.

over that reported by Tuttle. The most noticeable change observed was that the average maximum density of theatre release prints is now approximately 3.0 as compared to the 1935 results of 2.4. It should be noted that during the viewing of the various scenes at different stray-light levels, the darker scenes were found to suffer the greatest loss in quality for any given stray-light level compared to the scenes classified as light or normal. This result is common knowledge to the drive-in theatre owners where the screen quality of dark murder-mystery scenes is sometimes quite objectionable on a bright moonlit evening. A dotted line has also been added to the graph in order to represent the "average print." This line will serve as the standard for picture quality vs. the stray light in the illustrations to follow.

The range in stray-light conditions found in Figure 1 is known to exist at various times during the projection of motion pictures on outdoor theatre screens, as well as in poorly-darkened classrooms and auditoriums. It is hoped that this information will bring about a better understanding of how the screen-brightness and stray-light problems affect the picture quality of the projection screen.

Damage Picture Quality

The sources of stray-light damage to picture quality can usually be limited to one or more of the following:

1. Darkened room admitting unwanted light from outside the room or from unsuitable light fixtures in the room.

2. High reflectance of the projection room walls and ceiling which reflect the screen light falling upon them back upon the screen. This effect from light-colored surfaces may be quite pronounced in narrow rooms and rooms with low ceilings, whenever the screen occupies a relatively large area at one end of the room, or is so located that the picture area is very close to the walls or ceiling.

3. The light produced by lens flare. In the past few years, the effect of lens flare has been reduced considerably by coating projection lenses, and it is not as great a source of stray light on the screen as formerly. For some lenses, the effect of coating has been to reduce the flare light from the lens by more than two times. Even so, scratches, dust, and finger prints on projection lens surfaces may cause a large amount of flare light. For outdoor theatres, dust and dirt on projector lenses must be removed at frequent intervals. Great care should be taken in this operation, because the high grit content in the dust will easily damage the lens surfaces.

4. Where fairly long distances are involved between projector and screen, scattering of light from the projection beam by moisture and dust particles in the air gives rise to non-image-forming light which may set a minimum stray-light level on the screen below which further modification in theatre design and optical equipment cannot be effective.

5. Moonlight, skylight, and other sources of illumination add additional stray-light problems for the outdoor or drive-in theatre screen.

IMPORTANCE OF ADEQUATE SCREEN BRIGHTNESS

The upper curve in Figure 2 represents the general tone reproduction for a reversal color print whenever it is projected on a screen free from all stray light. For this condition, a projected color picture matches very closely that

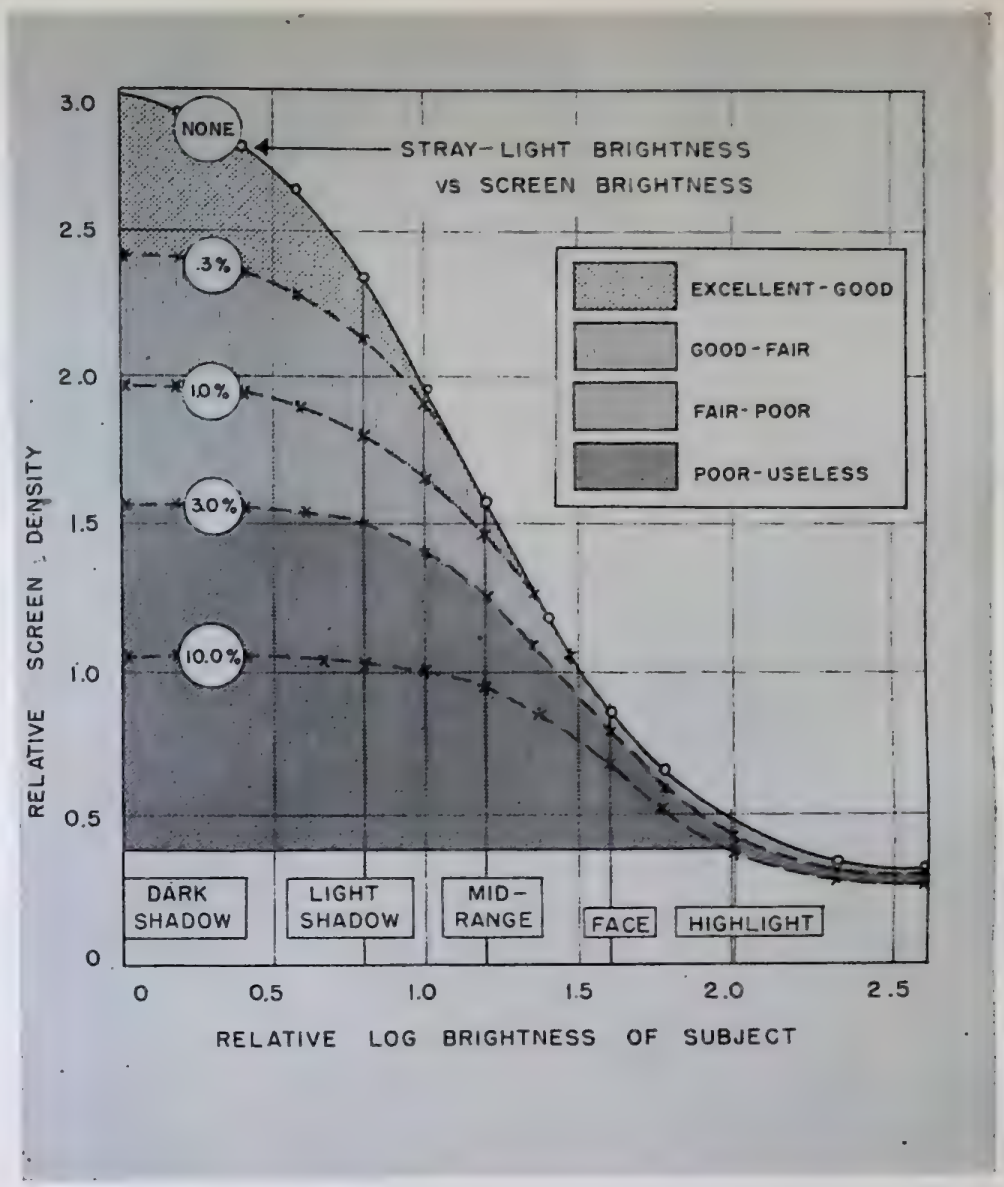


FIGURE 2 illustrates the stray-light effects on the tone reproduction of the screen image of a reversal color print, including the reaction of the theatre audience to the varying conditions.

observed when the print is viewed in front of an illuminator. The other curves show the degradation in tone reproduction which occurs to the picture on the screen as the level of stray-light brightness is increased to 0.3 per cent, 1 per cent, 3 per cent, and 10 per cent of screen brightness.

The general location of shadow, mid-range, face and highlight regions in an average scene have been added at the bottom of the graph to make it easier to locate these positions on the tone reproduction curves. It can be noted from studying these curves that stray light lowers the density in the dark shadow areas of the screen image by a much greater amount than in the lighter regions represented by the face and highlight densities. The higher the percentage of stray light reflected by the screen to the audience, the less pleasing and crisp the picture looks upon the screen. Audience reaction to stray light is recorded in Figures 1, 2, 3, and 4.

Tone reproduction curves similar to those on the previous graph were obtained (Figure 3) when the stray-light brightness was held constant at 0.1 ft-L, while the screen brightness was varied from 20 ft-L to 1 ft-L. This is the screen-brightness range found in the screen-brightness and stray-light survey of theatres and drive-ins. It is important to note that it is necessary to consider both the stray-light level and the screen brightness in specifications relating to the projection of good quality films.

Experiment

A rough reproduction of this experiment might be tried in your own home using a projector such as a 35mm Kodaslide projector equipped with a 5-inch f/3.5 projection lens and a 200-watt, 120-volt lamp. A 28-by 42-inch piece of white matte paper, such as art board or a white blotter, can be used for the screen. *Do not use a beaded or aluminized screen.* Obtain a 10-watt, 115-volt frosted light bulb and place it about 10 feet in front of the projection screen in such a manner that it will illuminate the screen without shining in the viewers' eyes. This lamp will now produce about 0.1 ft-L of stray light on the screen. Next, locate the projector so that the slide image fills the screen. This will produce a screen brightness of approximately 20 ft-L. Make a series of holes in black or opaque cardboard, graduating the size of the holes from one slightly less than the diameter of the projection lens down to a hole the size of a lead pencil; when one of these holes is held in front of the projection lens, screen brightness is reduced. When the small hole of lead-pencil size is placed over the center of the lens, the screen brightness is reduced to approximately 1 ft-L. If you project several of your favorite slides under these conditions, the importance of adequate screen brightness and the degrading effect of stray light will become obvious.

The 0.1 ft-L stray-light brightness on the screen was selected because it has been related by some people to the statement that 0.1 foot-candle of miscellaneous illumination in an auditorium is not harmful to the quality of projected pictures. Usually, these articles make reference to a paper written by Loyd A. Jones and published in the 1920 Transactions of the SMPE.[4] In quoting this paper, many people have used his recommendations without qualification and have neglected to state that the information Jones reported was based upon data collected at a screen brightness level of approximately 20 ft-L. Furthermore, Jones shielded his auditorium lights so that only 0.02 to 0.04 ft-L of stray light were reflected by the screen as a result of the auditorium illumination. Therefore, the amount of stray light on the screen, which resulted from the level of indirect illumination approved by Jones, represents approximately 0.2 per cent of the screen brightness.

Figure 3 is the result of a carefully controlled experiment with greater refinements than the suggested home experiment. It should be noted that the picture quality, represented by the shaded areas, as well as the tone reproduction, denoted by the curves, *drops* when the level of screen brightness is decreased from 20 ft-L to the lower limit of 1 ft-L in the situation where stray light is held constant. The figure 5 ft-L of screen brightness is important to classroom users of standard 16mm incandescent projectors because little more than 5 ft-L can be expected on a matte screen from this projector equipped with a 1000-watt lamp, even when the screen is only 10 feet wide.[5] Increasing the picture size to 20 feet drops the brightness to approximately 1 ft-L. Higher brightness levels or larger pictures can be obtained with carbon arc projectors, but here again for 16mm pictures, the 5 ft-L level is reached at a picture width of about 20 feet. These curves illustrate the importance of maintaining an adequate level of screen brightness and the rapid increase in stray-light problems which occurs whenever the picture size is expanded beyond the light-producing capacity of the projector for either 16mm or standard 35mm theatre equipment.

Good picture quality on the screen is important to all who are concerned with the production and processing of films. This includes film and equipment manufacturers as well as those who labor toward bringing to the projection booth the best obtainable motion picture print.

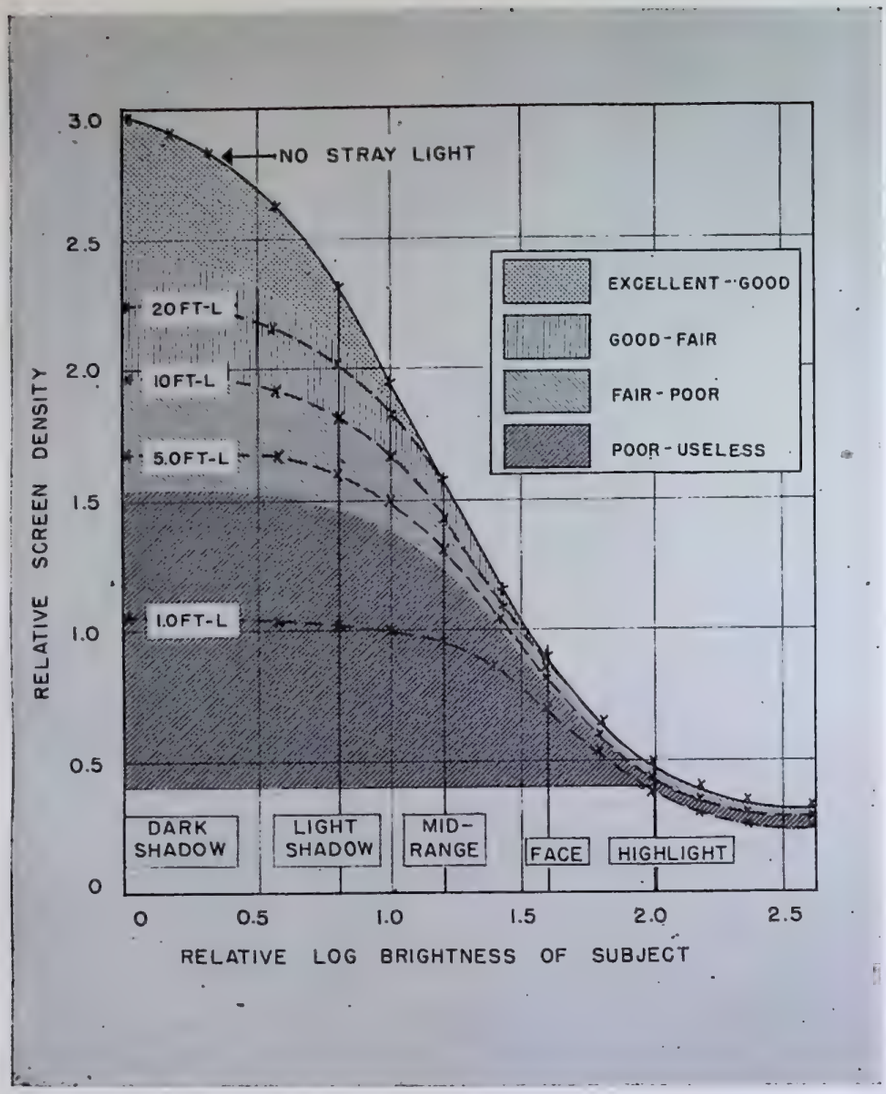


FIGURE 3 shows tone reproduction of a reversal color print with a constant stray-light brightness of 0.10 ft-L on the projection screen. Audience reaction for various levels is indicated on left.

density scenes, they are naturally least affected by the stray light present on the screen.

During the period of full moon, the stray-light brightness of the outdoor screen may climb to more than one per cent for the average "drive-in" possessing a screen brightness of 3.0 ft-L and probably will exceed three per cent for those operating at screen brightnesses in region of 1.0 ft-L. Under these conditions, the viewer may experience great difficulty in following any of the action in the dark scenes.

Fluctuations in the stray-light level can also become a problem in other situations, for example, the classroom, even though the quality of the light which is being projected may be rated as excellent. The compression in the screen density range, as a result of stray light, is most noticeable in the dark shadow regions of the print, since, in this situation, density is lost much faster than in the light areas. After studying Figure 4, it is not difficult to see why the dark shadow areas of the picture lose their identity when stray light becomes excessive.

In making the screen-brightness survey at these six drive-in theatres, data were also recorded on the projection equipment, including projection lenses, type of carbon, arc current, and light-collecting mirror or lens. Measurements were made to determine the percent reflectance of the screen as well as the total light output of the projectors.

On the basis of this information, the following results were calculated:

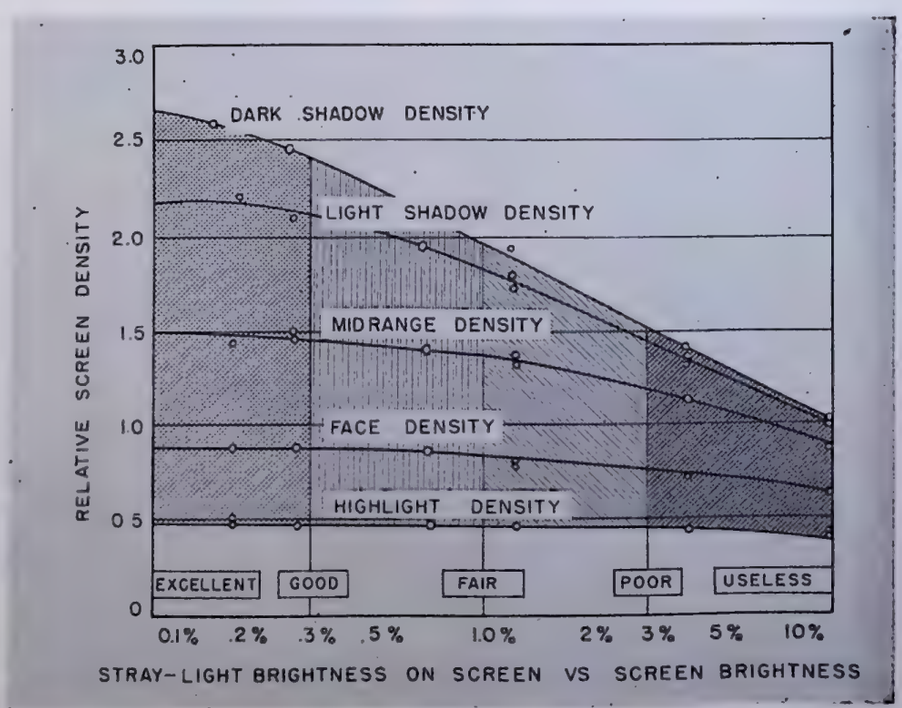
Those who project the films are at the end of a long chain in which everyone must do his part well or success changes to failure.

STRAY LIGHT AT DRIVE-IN THEATRES

Figure 4 illustrates, in another way, the changes in screen density and picture quality for five different regions of print density as the amount of stray light relative to the screen brightness is varied. For the average drive-in theatre, good picture quality is seldom possible on a clear evening until approximately 50 minutes after sunset. (Here a 3 ft-L screen brightness is assumed for a projection screen facing away from the sunset.) Since some "drive-ins" start picture projection at 9:00 p.m. E.D.T. during June and July in the Rochester area, and the remainder are in operation before 9:15 p.m., the stray-light level on the screen at the start of the show is actually equal to the brightness from the projector.

Therefore, it has become customary practice at these "drive-ins" to begin their show with a cartoon. Since cartoons are usually composed of light

FIGURE 4 illustrates the changes in screen density and picture quality as a result of the stray light.



	Average	*Range*
(a) Projector output as percent of theoretically available light	56%	39% to 77%
(b) Percent reflectance of screen	72%	55% to 91%
(c) Over-all efficiency of the projection equipment including the screen	40%	21% to 70%

Many farsighted managers of drive-in theatres have invested a considerable amount of money installing high-intensity projectors in order to obtain a better screen quality. However, purchasing and installing this equipment is not enough unless the equipment is carefully adjusted and maintained. Projection equipment poorly adjusted can easily be compared to a car whose motor is "out of tune." The poor adjustment robs the car of its performance

With proper adjustment and maintenance, it is possible to get these projectors to deliver to the screen at least 80 per cent of their rated available light output.[6] It is also possible to have the projection screens painted so that they will reflect at least 80 per cent of the projected light.

The Results

Recalculating the results of the survey on this basis would give an average brightness for these six drive-in theatre screens of about 3.8 ft-L, a value approximately double that measured. Certainly this change would result in improved picture quality. Improvement would be especially noticeable in the case of one theatre where a few rapid adjustments prior to the survey more than doubled the screen brightness and where survey data indicated that this brightness could be increased again by another factor of three merely by replacing scratched mirrors and projection lenses, repainting the screen, and completely aligning the projector optical system. Adequate brightness is important, not only to overcome unavoidable stray light, but also to present pictures that are aristically pleasing.

After making any adjustments to the projector optical system, full attention must be paid to adequate cooling of the film at the projector gate. With the increase in screen illumination, there may be enough increase in the temperature of the film at the aperture to severely damage the print through blistering. Therefore, after the projector optical system is adjusted, it is wise to run a test film such as is described in the booklet, "Common Causes of Damage to 35mm Release Prints," which may be obtained from the Motion Picture Film Department, Eastman Kodak Company, Rochester 4, New York.[7] (See 1952 THEATRE CATALOG, page 254.)

Motion picture film producers release their pictures so as to appear most satisfactory at the American Standard Screen Brightness for 35mm Motion Pictures of 9 to 14 ft-L. Many scientific tests covering the past 30 years or more of investigation have shown that the quality of pictures made to be shown at this brightness level is superior to the quality of the same films when projected at lower levels of screen brightness. Furthermore, the data indicate that it is better to make prints which are optimum for a screen brightness of approximately 10 ft-L even if they must sometimes be shown at 2 ft-L, than to make prints which are best for 2 ft-L knowing that usually they will be shown at the standard brightness of 10 ft-L.[8]

THEATRE SURVEY

The following data have been collected from a screen-brightness and stray-light survey of regular and drive-in theatres in the Rochester, New York, area.

1. REGULAR THEATRES—3 large (over 2200 seats)
   5 small (300 to 1200 seats)

	Average	*Range*
A. Screen brightness at the center of the screen.	11 ft-L	6 to 17 ft-L
B. Minimum brightness of the screen resulting from the normal operating light on the auditorium with projector turned "OFF."	0.006 ft-L	0.002 to 0.007 ft-L
C. Stray-light level on the screen during the projection of a normal density print.	0.03 ft-L or 0.3% of the screen brightness	0.02 to 0.05 ft-L*
D. Distance from booth to screen (Throw).	140 feet	65 to 195 feet

**The highest stray-light condition was found in a theatre which used a light-colored drape directly behind the perforated projection screen.*

2. DRIVE-IN THEATRES—6 with a capacity of 550 to 1000 cars

	Average	*Range*
A. Screen brightness at the center of the screen.	2.4 ft-L	1.3 to 3.2 ft-L
B. Width of screen.	52 feet	47 to 59 feet
C. Distance from booth to screen (Throw).	240 feet	210 to 290 feet
D. Brightness of the screen on dark nights with the projector turned "OFF."	.003 ft-L	.002 to .006 ft-L
E. Total stray-light brightness on the screen relative to the screen brightness during the projection of a normal density print on a dark night. (This does not represent average conditions which would take into account early evening skylight, moonlight, or light scattered from the projector beam by rain, fog, or excessive dust in the atmosphere.)	0.6%	0.4% to 1.0%

F. The following data were collected at one drive-in theatre where the matte-painted screen faces east directly away from the setting sun. The data are reported for a clear evening in the month of March at 43° north latitude. (During June-July multiply the time in minutes after sunset by 1.3 as a result of the longer twilight period at this time of year.)

Minutes After Sunset	*Stray Light on the Screen Relative to a Screen Brightness of 2.2 ft-L*
12	134% — 2.95 ft-L Stray Light*
18	41% — 0.09 " " "
24	12% — 0.27 " " "
30	4.0% — 0.087 " " "
40	0.7% — 0.016 " " "
50	0.2% — 0.005 " " "

**These stray-light values will be considerably higher for outdoor projection screens which face the sunset.*

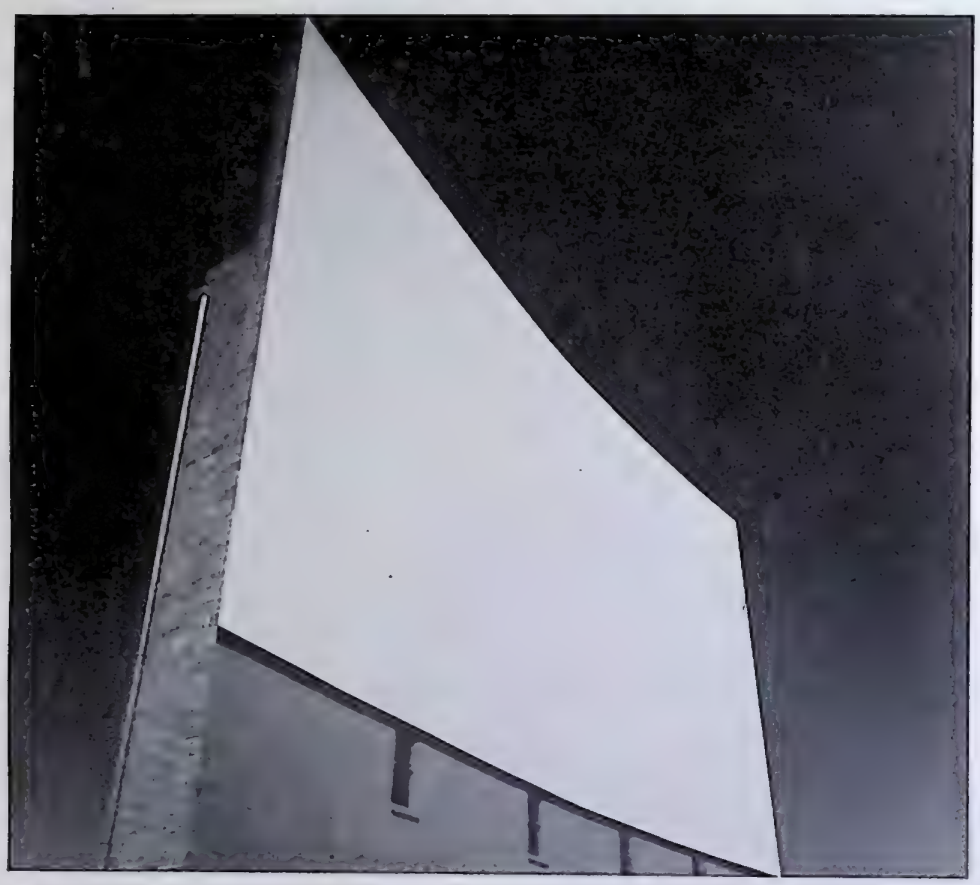
G. The brightness of the screen due to moonlight may reach approximately 0.02 ft-L or 1% of the screen brightness for the average drive-in. When the stray light produced by lens flare and scattered light from the projected light beam are added to that from moonlight, the total amount of stray-light is about 2% of the screen brightness. Even higher stray-light ratios occur when there are other large sources of additional stray-light flooding the screen, where projection optical equipment is not in good condition, and where the screen brightness is lower than 2 ft-L.

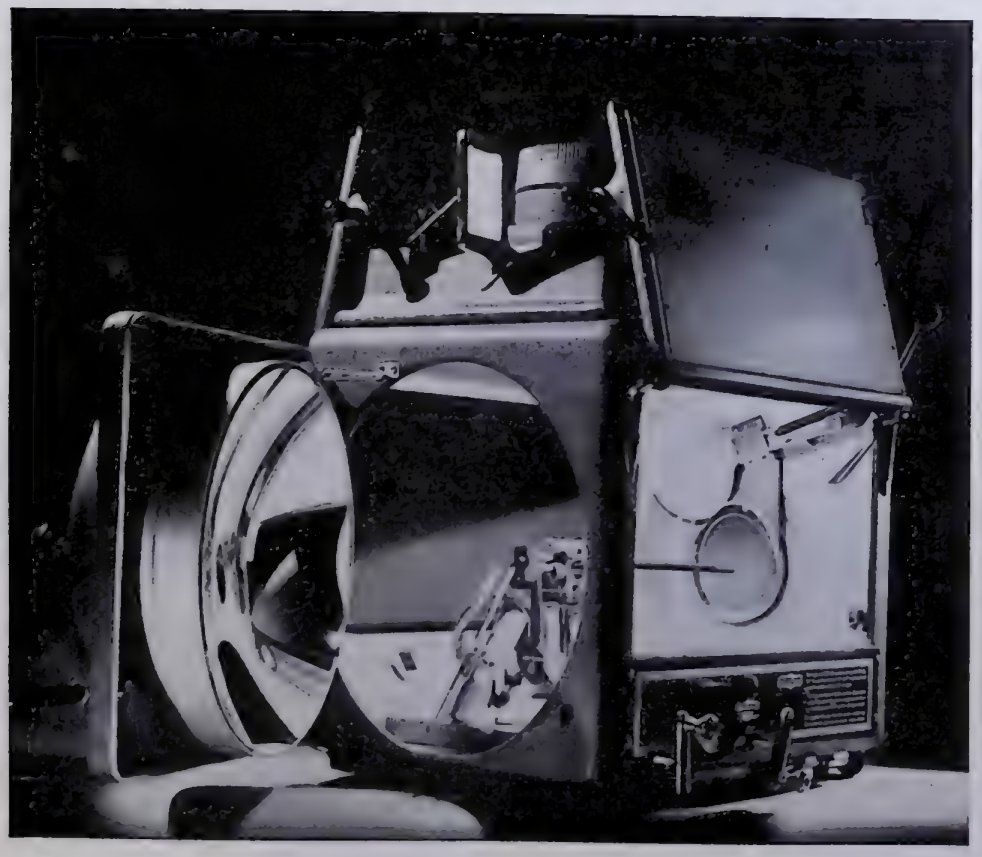
just as dirty, scratched, and misaligned optical equipment, deteriorated screen surfaces, and other manifestations of poor maintenance rob the theatre of the picture quality it could present to its patrons.

We believe that the performance of the drive-in theatres we measured is typical of such theatres generally, and that many theatres could noticeably improve their picture quality by giving more attention to equipment adjustment and maintenance.

CONCLUSIONS

Four important points which deserve attention in relation to the screen quality of projected pictures have been noted:





THE GIANT SIZE of the drive-in screens, such as the one at the Airport, Omaha, Neb., (above) plus the difficulty of controlling outdoor lighting, makes it important that everything possible be done to curb stray light effects. Use of good equipment, such as the Strong Super 135 lamp (below) will help.

1. Screen quality is largely dependent upon the ratio of limits established between the screen brightness and the stray-light brightness of the screen. The results show that the stray-light ratio should not be greater than 0.3 per cent of the screen brightness for maximum picture quality.

2. Stray-light problems increase as screen brightness is lowered. It is important not to attempt to expand the size of the projection screen very much beyond the light-output capacity of the projection equipment which will give a 10 ft-L screen brightness and/or to operate with projectors and screens in an unsatisfactory condition.

3. Dark scenes are affected more severely by stray-light than light or normal density scenes. The presence of very dark scenes in motion pictures is of some concern to managers of drive-in theatres during periods of full moon, and where other forms of stray-light are a continual and often an uncontrollable problem. Those responsible for classrooms and auditoriums not equipped with the proper room-darkening facilities have available to them literature which will describe ways to help correct their situation.

4. A screen-brightness objective of 10 ft-L is obtainable practically in nearly every indoor theatre, auditorium, and classroom, but the matte screen areas of outdoor theatres are so large that this brightness can rarely be obtained in a drive-in theatre. It is especially important for drive-in theatres that every effort be expended to insure that all equipment is operating at its maximum efficiency.

LIST OF REFERENCES

[1] A report of the Committee on Non-Theatrical Equipment, *J. Soc. Mot. Pict. Eng.*, Vol. 37, pp. 22-69 (July, 1941).

[2] *Classrooms*, No. 1 of the series. *Planning Schools for Use of Audio-Visual Materials*, Dept. of Audio-Visual Instruction, National Education Association, 1201 Sixteenth St., N.W., Washington, D. C., July, 1952 (see pp. 1-34).

[3] Tuttle, C. M.: Density measurements of release prints. *Jour. Soc. Mot. Pict. Eng.*, Vol. 26, pp. 548-553 (May, 1936).

[4] Jones, L. A.: Interior illumination of the motion picture theatre. *Trans. Soc. Mot. Pict. Eng.*, Vol 10, pp. 83-96 (May, 1920).

[5] Offenhauser, W. H.: *16mm Sound Motion Pictures*. Interscience Publishers Inc., New York, 1949, 1st edition (see Chap. XIII, pp. 450-460).

[6] *Recommendations to Projectionists for Theatre Screen Light Checking Procedure, Information Bulletin #6, 58. 699-A, 223*, Motion Picture Research Council, Inc., 1421 North Western Avenue, Hollywood 27, California, (July 3, 1953) 22 pages.

[7] *Common Causes of Damage to 35mm Release Prints*, Motion Picture Film Department, Eastman Kodak Company, Rochester 4, N. Y.; 1952 (see pp. 50-54).

[8] Clark, L. D.: Picture quality of motion pictures as a function of screen illuminance. *Jour. Soc. Mot. Pict. and Television Eng.*, Vol. 61, Part II: pp. 241-247 (August, 1953).

Single Strip 3-D

An Examination of Two of the Leading Methods of Obtaining Three-Dimensional Pictures on a Single Strip of 35mm Film

In 1953 three dimensional motion pictures roared upon the scene with the excitement of a fireworks display at a Chinese New Year's celebration; and seemed to fade with the same suddeness. One of the major objections to 3-D films was the necessity of using two projectors, with interlocking devices, 5000 foot reels, and clumsy intermissions. In addition, it was found that even with the best equipment, it was almost impossible to keep the two projectors in perfect alignment.

BRIEF: ***Although 3-D had a tremendous initial success two years ago . . . when it was reintroduced to the public . . . the problems inherent in the need for two interlocked projectors in order to show 3-D . . . quickly drained off much of the enthusiasm on the part of the public . . . which had to put up with eye-strain . . . dim screen images . . . and intermissions . . . Exhibitors who had to use special reels . . . extra carbons . . . generators . . . more electricity . . . and in some cases extra projectionists . . . also started to stay away from this form of picture.***

This article gives the up-to-date details about two systems that use a single strip of 35mm film to achieve the 3-D effect . . . With these systems it is possible to run a 3-D film in much the same manner as an ordinary 2-D offering . . . and also give the public a sharper . . . and brighter picture at the same time.



THE EXPRESSION on the face of the pretty model showing off a pair of polaroid viewers seems to be asking the question, is 3-D dead? Single strip systems might supply the answer to this question.

As has always been the case, whenever there was a problem in the industry, solutions to dual projector 3-D have started to appear. The material presented here represents two efforts being made to revive interest in three-dimensional films.

VECTOGRAPH SINGLE STRIP 3-D

As this edition of THEATRE CATALOG goes to press, a team of scientists and engineers, combining the top talents of two leading photographic laboratories, is busy on the final stages of a development program that promises to put 3-D back in the movies—and put it back to stay. The laboratories are those of Technicolor Motion Picture Corporation and Polaroid Corporation. Their goal is the commercial manufacture and printing of Vectograph film for 3-D movies.

What will Vectograph film have to offer the motion picture industry when the research teams complete their jobs? What effect will it have on the viewing-quality of 3-D movies? How does it fit with other 3-D projection methods and with big-screen systems such as CinemaScope and Vistavision?

Future Holds the Answers

The future will have to write the answers to some of these questions, but with a few technical facts about Vectograph film you can make some preliminary forecasts for yourself.

The basic fact about the new film is that with it you will be able to project a 3-D movie in full color with a single projector, without any attachments whatsoever. Patrons will wear polarizing viewers and the screen will be one of the modern types having a metalized surface. Otherwise, everything is as easy as it is for ordinary 2-D movies. The operator need not even know that he is running a 3-D picture.

At first glance, a strip of Polaroid Vectograph film looks like a strip of any other 35 millimeter color film. It looks the same, even feels the same. Potentially, however, each film frame carries not one image but two, each occupying the full area of the frame. Both of the images required for true 3-D movies are superimposed on the same film base. Many important advantages result. As Dr. Kalmus summed it up in Technicolor's annual report:

> **"If this application of the Polaroid invention proves successful . . . it should provide a fresh impetus to the production of three-dimensional pictures by making them more comfortable to view and by making it easier for all exhibitors to show them."**

One Print Required

Specifically, for the exhibitor, it means that a 3-D picture will require one (Vectograph) release print, instead of two. The exhibitor will be freed from such special equipment requirements as interlocks, projection filters, oversize magazines. He will be able to run continuous 3-D shows, without intermission. He will require no additional operators.

Even more important, there will be no further difficulties with faulty synchronization. The two images are effectively locked in place, printed one over the other on the same film. This promises a degree of comfort and ease of viewing

that few 3-D audiences have ever enjoyed. With the two-projector system, even at its best and under ideal operating conditions, it is a rare show that goes off without a hitch of some sort. Even with synchronization correct, there has almost always been some difference in light output between the two projectors; audiences have often had in effect a daytime picture in one eye and a night-time picture in the other, an experience far from relaxing. Aside from this, there have been other difficulties harder to remove or correct: One picture has often been a trifle larger than the other because of a small mismatching of focal lengths of projection lenses; a slight weave and jump of the film in the individual projectors has had the effect of pulling the three-dimensional space this way and that, forward and back.

All these troubles disappear when the two images run on a single film through a single projector.

Problems Solved

Another problem that should be disposed of when Vectograph film is made available, is the problem of screen brightness together with the closely related problem of picture sharpness. Unlike any other single-film system that has been proposed for the projection of 3-D motion pictures in full color, Vectograph film uses the entire film area, instead of only one half of each frame, for each of the two images required for 3-D. Instead of two half-sized images placed side by side or one above the other within the frame, two full-sized images are superimposed one over the other. This means twice as much film area available for each image, twice as much light on the screen for a given light source, and twice as much area for achieving picture definition.

These factors are of the highest importance in connection with the long-promised "marriage" of 3-D and wide-screen techniques. One of the goals of Technicolor—Polaroid development is a standard of picture quality which promises to make the marriage a happy one.

Unusual Properties

The unusual properties of Vectograph film are based on the fact that the images are rendered in terms of degree of polarization of the light transmitted through the image. The images are not made in any of the ordinary ways, from opaque pigments like lamp black, for example, or metallic particles like the silver grains of photography. The images, instead, are intrinsically light polarizers.

The invention is the work of Edwin H. Land, President and Director of Research at Polaroid Corporation and inventor of modern sheet polarizing materials, in collaboration with Joseph Mahler.

A singular property of polarized light allows the two images to be superimposed without interfering with each other.

Ordinary light is made up of a helter-skelter mixture of vibrations lying in all possible directions crosswise to the direction of the beam. After it has passed through a polarizer, these vibrations can be visualized as an orderly array of flat ribbons, all parallel with each other and all lined up with polarizing axis or "optical grain" of the polarizer. These ribbons can be visualized as passing easily through a second polarizer if they are all lined up with its optical grain.

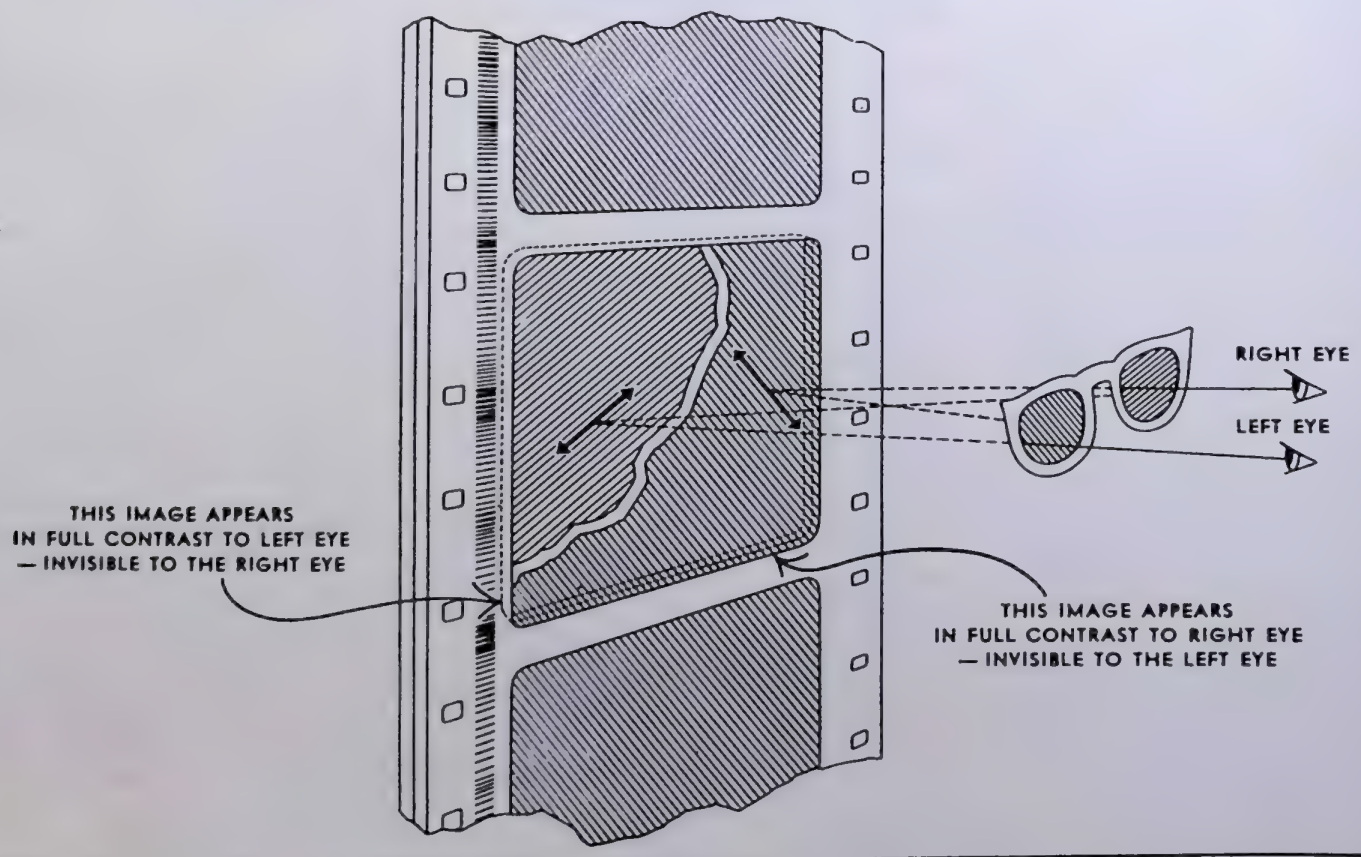
When you look at a perfect light polarizer through another polarizer, it will appear essentially black if the polarization axes of the two polarizers are crossed at right angles. The ribbons cannot pass through "across the grain." The second polarizer will be clear and practically invisible, however, if the vibration directions of the two are lined up parallel to each other. This fact can be demonstrated easily with two polarizing filters.

If the polarizer you are looking at is not perfect—if it is only polarizing part of the light—it will appear grey, not black, when your viewing polarizer is crossed with it. It will be darker or lighter as its degree of polarization is greater or less. It will still be invisible, nevertheless, if the viewing polarizer is lined up with it.

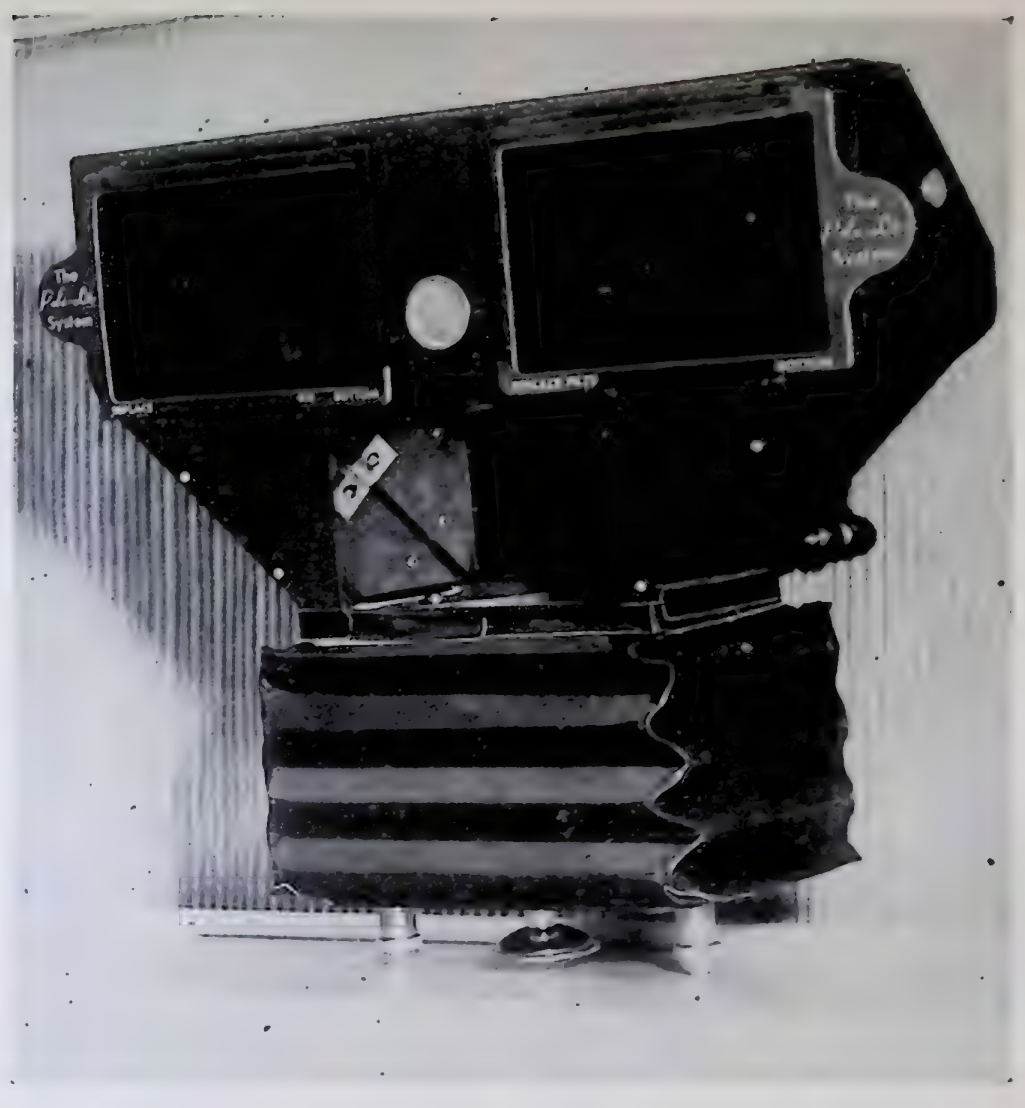
For presenting three-dimensional pictures, both sides of the Vectograph film are employed. On each side, printing solutions are employed to set up an image in terms of polarization—a high degree of polarization for areas which are to appear dark, a low degree of polarization for areas which are to be light. This control of the degree of polarization determines the point-to-point density of the images when they are seen through polarizing viewers. It creates the pictures in terms of percentage of polarization.

THIS diagram helps to explain how the Polaroid Vectograph system of single strip 3-D operates.

VECTOGRAPH FILM IS A COMPLETE, SELF-CONTAINED STEREO MATERIAL, WHICH MAY BE VIEWED DIRECTLY OR PROJECTED IN A STANDARD PROJECTOR WITH NO ATTACHMENTS



THIS IS the Pola-Lite single strip 3-D unit. It is simple to attach and the system does not require any changes in the booth procedure.



To separate the pictures, one for each eye, the Vectograph film is so designed that the two sides of the film have their optical "grain" running in different directions, at 90 degrees to each other, one 45 degrees to the left of vertical, the other 45 degrees to the right of vertical. Furthermore, the viewing spectacles have their polarizing lenses similarly arranged, with the axis of one lens at right angles to that of the other. Through the viewers, the left eye sees the image projected from one surface of the Vectograph film; the right eye sees the other. There is no conflict. Only one of the images is visible to each eye.

Several different ways of setting up the polarizing images have been devised for different purposes. One of these, which promises to make practicable the production of full-color motion picture release prints, is an adaptation of the dye-transfer printing, which uses matrix films to transfer the necessary dyes to the specially-prepared surfaces of the Vectograph films.

3-D's Future

How will Vectograph affect the future of 3-D? Dr. Land has commented as follows on this point in a special report to the Polaroid board of directors:

"Aside from its obvious economic advantages, one of the most important results may be to release the full creative energies of the motion picture industry from preoccupation with the mechanical aspects of stereoscopic pictures so they can be concentrated on the mastery of the artistic aspects. "Here is the great challenge and the great opportunity. Over the years, the motion picture industry has given the world a succession of spectacular demonstrations of the power of realism in entertainment; first, with the motion itself; then with sound; then color. Now the talents of this same industry have, quite literally, a new dimension to exploit; all the space in the world (again, quite literally) to work in. This space can be thrown away, as a passing novelty.

Or the industry can determine to use the space, the solid realism of the new dimension, as a true addition to the medium they have created. This would be our best assurance that people will be enthusiastic about 3-D after the novelty has worn off; they will be enjoying themselves, carried away by the realism of the art."

There remains the important question of when Vectograph film will be made available commercially for the release of 3-D pictures. Technicolor's official word on this subject, repeated by Polaroid, is a cautious statement that the two laboratories will "make these new stereoscopic motion picture prints available to the theatres as soon as possible. Although the new product has been demonstrated by Polaroid on an experimental scale, considerable work will be necessary to produce commercial release prints."



THE UNIT contains its own filters and allows for the showing of both 2-D films and 3-D films.

POLA-LITE SINGLE STRIP 3-D

A single strip 3-D method which is already on the market, and has played in a number of theatres is the Pola-Lite 3-D system. This new system eliminates all synchronization devices, the running of two projectors is eliminated, it does away with the second operator, cuts carbon and electric consumption. The unit contains its own filters and prevents the film from going out of synchronization. It also should help eliminate the eyestrain that results from two variations of light as found in the dual projector 3-D systems.

The booth operation with the Pola-Lite 3-D system is the same as when the theatre is showing a standard 2-D offering.

The Pola-Lite 3-D system was perfected by a young foreign-born engineer, Dr. Leon W. Wells. One of the advantages of the system is that once the Pola-Lite unit is attached to the front of the projection lens, it allows for the showing of both 2-D and 3-D films.

How to Attach Unit

Insert the Pola-Lite aperature. Hold the unit with the two stud rods pointing down, and the two filters or windows facing front. The neck of the unit is slipped over the projection machine lens. This should be pushed over the lens barrel at one-half inch so that it grips firmly.

When the unit is hanging over lens barrel, open the light. Heat will not affect the unit. You will now see two aperture images on the screen. Level these images by rotating the entire unit on the lens barrel. When the top edges of the images are level and parallel to the top of the screen, tighten the unit to the lens barrel by means of the clamp with an Allen wrench.

How to Align Light on Screen

The next step is to superimpose the two aperture images on each other. This is accomplished by the three Allen screws, and the alignment is maintained by the set screws which should be loosened before adjusting.

The top screw will bring the images together horizontally. The two side

screws will bring the images together vertically. Turn the screws one at a time and watch to see the effect on the screen. Now bring the images together horizontally, by using the sizes as reference, and vertically by using the top as reference. When there is perfect alignment both on top and sides, tighten the set screws so that the unit is locked in the right position.

Centering Images

Now that the images are aligned relative to each other, the resulting double image must be lined up on the screen vertically and horizontally. Raise or lower the aperture images, by using the adjusting screws. These screws work against each other and should be used gently. A very small adjustment will move the image a large distance on the screen. To lower images, loosen the top screw and tighten the bottom screw, watching results on the screen. When images are located properly tighten the top screw.

To move the images right or left on the screen, use the adjusting screws. The wing nuts must be loosened when making this adjustment. To move the image to the left, loosen the wing nuts and tighten screw about half a turn. Tighten the wing nuts. The aperture images will no longer be together.

Now loosen the set screws and repeat the alignment procedure. You should now find that the perfectly aligned aperture images are now further to the left. Repeat this sequence of operation until you are satisfied with the picture location.

Test with Loop Chart

It is now time to use the loop chart film. The two images should be perfectly superimposed on each other. If they are off sideways, turn your regular framing device until they overlap. If they are off vertically, loosen the set screw, adjust and re-tighten.

Look into the aperture to determine how to put in the film without future need for framing. Then focus the 3-D film exactly as you would for a 2-D print. Once the Pola-Lite unit is focused for 3-D it is not necessary to refocus for a regular 2-D show.

A certain amount of light may overspill the bottom of the screen. This looks like a reflection of the picture. To eliminate this overspill, take a piece of shim stock, about .008 inch thick, and cut two pieces four and three-quarter inches long, and about one inch wide. Now trim the width to suit your particular installation so that when placed in the lower slot behind each filter, the shim blocks off the overspill from the particular window. Be sure the upper edge of the shim has no burrs.

Check Filters

The Pola-Lite filters are supplied in a box containing four sets. It is advisable that a new set of filters be used for each new 3-D engagement.

When inserted on the unit see that the arrows on each filter point towards each other.

To project 2-D programs when the Pola-Lite unit is on the projector, it is only necessary to lower the center prism of the unit. This is done accordingly: On the bottom of the unit there are two wing nuts; screw these wing nuts off and pull down the two stud rods.

The entire unit remains on the projector. The prism unit remains hanging on the stud rods protected by the bellows. Change back to the regular aperture and everything is now restored for the projection of a normal program.

To change again to 3-D projection, change the aperture, push back the prism unit, tighten the two wing nuts. Do not misplace the wing nuts. Be sure to tighten these nuts before starting the 3-D performance.

Some Suggestions

The lens barrel must project out of the projection head. If a theatre is operating with the lens totally inserted into the projection head, then the exhibitor must secure a couple of "lens barrels." These are readily available at local supply dealers.

If, when the images are superimposed on the screen, the upper edge of the light from the left hand window is above the upper edge of the light from the right hand window, then remove the aperture and file down the right hand side of the aperture opening, dressing the edge carefully to remove burrs. Do this very carefully until the edges are superimposed. In case the right hand image is higher file the left side of the aperture opening.

Pola-Lite prints and the Pola-Lite system are developed for a ratio of 1.77 to 1 picture. Many theatres maintain their present lens with Pola-Lite although height and width of the picture is reduced. For this reduced size picture it is suggested that the screen be masked on the top and sides—this will give an adequate picture. Other theatres wishing to compensate for this slightly reduced picture size may do so by using a shorter focal length lens.

To protect the Pola-Lite 3-D unit, once the attachment is removed from the projection machine, it is suggested that you replace the filters by the cardboard slides with which the unit was originally supplied, and then keep the unit in the specially constructed carton in which it was delivered. With some lens tissue in the barrel opening, you can securely protect the unit from dust and possible breakage.

NATURALLY, only time will tell whether audiences will once again accept three-dimensional films, such as the one seen here. Many of the problems which were found in the two projector method are eliminated with the single-strip systems. It is now up to the public to make its decision.



Changing Service Scene

A Summation of the Advances Made by a Leading Sound Service Organization, and a Review of the Latest Methods Now In Use

By BERT ENNIS
Altec Service Corp.

BRIEF: ***This article follows the activities of one of the best sound service organizations presently serving the motion picture theatre field . . . The short history offered . . . also acts as a summary of the advances made in the presentation of sound and film in order to achieve the highest level of quality . . . and patron enjoyment . . . There are other sections devoted to the work of the sound service engineer of today . . . and how he is equipped to perform his job in servicing and installing the various magnetic and optical multiple channel sound systems . . . The review of the special instruments that have been developed is of great interest and indicates the amount of work and skill that are part of the service engineer's regular job.***

On December 7th, 1937, Altec Service Corporation, newly formed organization dedicated to the finest traditions and principles in the field of theatre sound and service, accepted its first contract from an exhibitor. Time does not permit a search through the records containing the names of thousands and thousands of theatres which have subscribed to Altec service since then, to establish the name of the first Altec customer. The chances are, if the theatre is still operating, it is among Altec's active accounts. That is one of the things this organization is most proud of; the continued confidence and loyalty its service has engendered on the part of exhibitors throughout the United States.

History

Much water has roared under the bridge since Altec undertook its first service job in 1937. Optical sound-on-film had become firmly established; the experimental stage of synchronous disk and film had become a memory; almost the same as the wonders of optical sound dimmed a year and a half ago as the brilliance of stereophonic sound engulfed the industry in a hopeful, optimistic aura, the glow of which, despite a natural series of circumstances and events, still persists.

True to the principles of progress, research and sound engineering knowledge on which it was organized in 1937, the changing scene in the field of technical service, maintenance, and installation found Altec fully equipped to keep pace with the developments which have crowded, one after another, into the amazed and sometimes confused purview of the industry at all levels of production and exhibition. It has been by no mere accident that Altec has successfully met the challenge presented by the advent of the new and varying techniques which have so radically changed service and maintenance procedures. Proof that Altec has kept pace with wide-spread technical advances in theatre sound is graphically illustrated in the pictures reproduced herein. These photographs deal with the procedures developed by our organization for the installation, service and maintenance of stereophonic sound systems in theatres of varying capacity. The Harrison Theatre, a 398 seat house in Westchester, Pa., and the Boyd, Bethlehem, Pa., a deluxe, 1500 seater, were selected to inform readers of THEATRE CATALOG concerning the routine followed by Altec field engineers.

Demonstrates Procedures

The captions accompanying these photographs are fully explanatory, and demonstrate such procedures as amplifier transmission tests, trouble-shooting during actual show projection, testing to determine presence of sound in penthouse magnetic pickup, demagnetization of projector mechanism parts, and a variety of other exclusive Altec service procedures in connection with stereophonic sound systems. The attention of THEATRE CATALOG readers is directed to those photographs taken in the booth of the Boyd Theatre, Bethlehem, wherein H. J. Brown, veteran Altec field engineer who services a number of theatres in the Pennsylvania area, adjusts the switching amplifier, sometimes called in industry parlance a "squelcher," thereby eliminating "monkey-chatter," or background noise present at times on magnetic film recordings. This procedure prevents distracting noises from assailing the ears

COMPLETELY renovated interior of the Harrison, West Chester, Pa., has a 27 by 16 foot screen. The small house is equipped with stereophonic sound.



THE Boyd, Bethlehem, Pa., is a deluxe operation of 1500 seats. Like the smaller theatre it too requires the services of the sound service engineer.

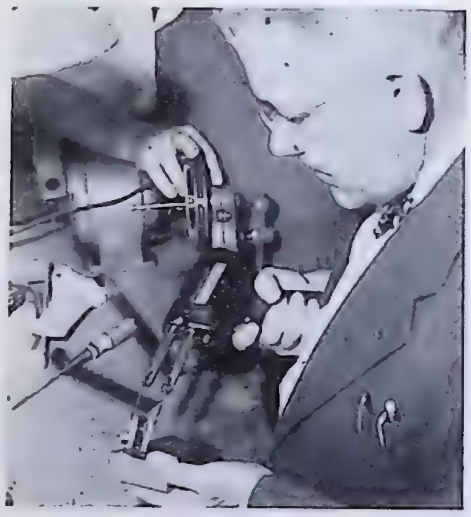




ENGINEER H. J. Brown makes use of special all-purpose meter to equalize system for use with the three speakers, assuring better sound quality than previously possible with old system.

of those patrons seated close to auditorium speakers. Another equally important service method employed by Altec field engineers deals with the proper poling and phasing of the Voice of the Theatre stage speakers which are in use in thousands of theatres using stereophonic sound systems. In order to assure uniform sound distribution of full frequency range, the characteristics of the three speaker systems must be matched perfectly.

We have said that it has been by no mere chance that Altec has been in the forefront of the technical advances which distinguish present day theatre sound. Because of the reputation this organization acquired at its inception for intensive sound engineering experimentation, research and development, Altec experience and products have played an important pioneering role in the revolutionary techniques which have changed the entire complexion of screen entertainment. Early in 1945, when Altec was completing the development of its "Voice of the Theatre" speaker systems, a group of motion picture studios, sound recording firms, and our organization conducted extensive experiments in stereophonic recording and reproduction for motion picture use. In 1947 Altec assisted the Research Council of Motion Picture Arts and Sciences in the establishment of new recording and reproduction standards to raise further the quality of motion picture sound. Before the group of men who conceived Cinerama brought it to successful fruition as an amazing picture and sound departure on Broadway, Altec's engineering forces were called upon for assistance and technical advice in the perfection of the stereosound system which accompanied the presentation of Cinerama, and Altec sound equipment was used for every test. Today, the stereophonic sound which amazes audiences during the nation-wide presentations of Cinerama is reproduced by Altec "Voice of the Theatre" systems.



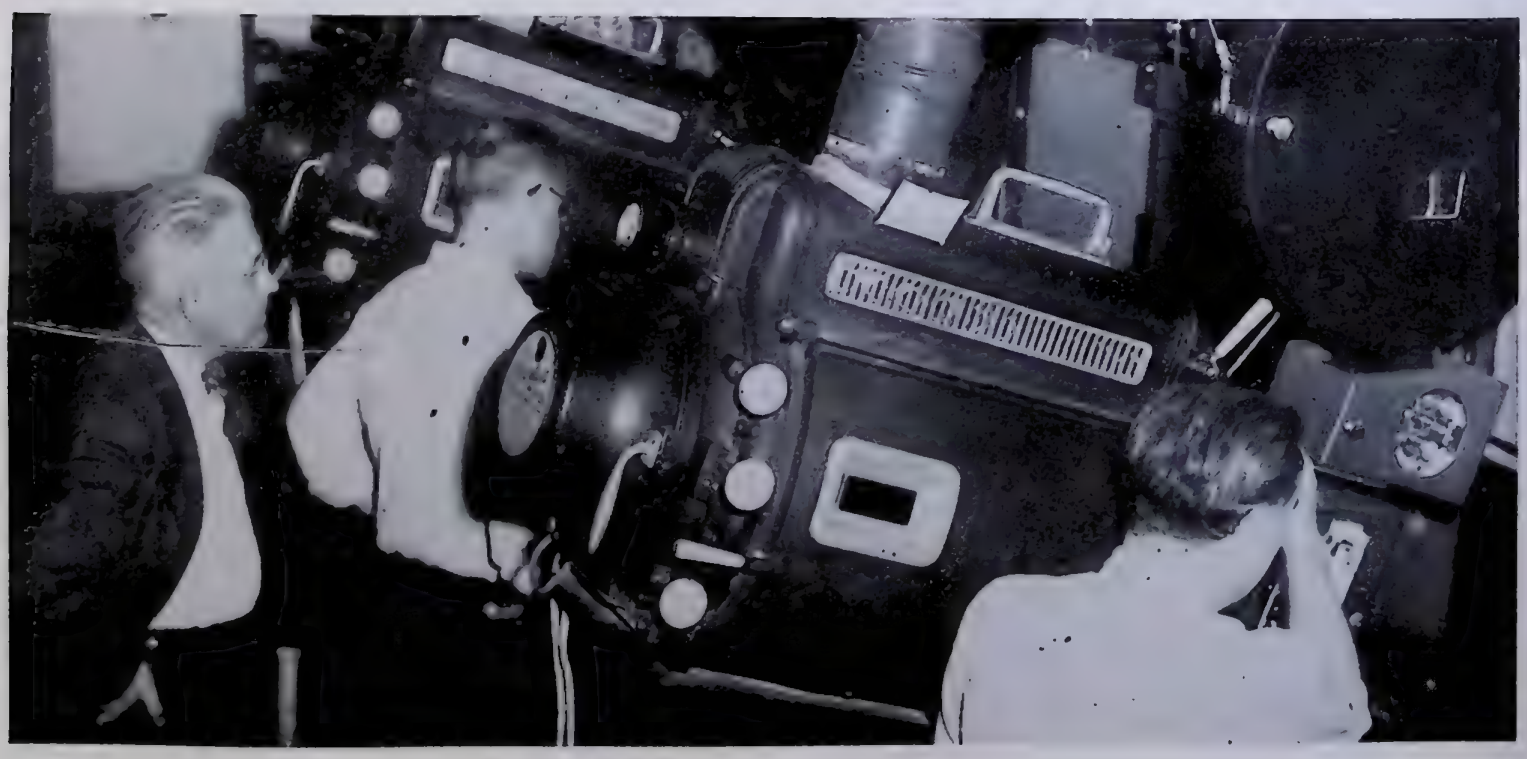
AFTER detecting magnetism, Brown employs a Degauser (above) in order to eliminate this danger. Another part of the serviceman's job is to evaluate sound (below) with projectionist.

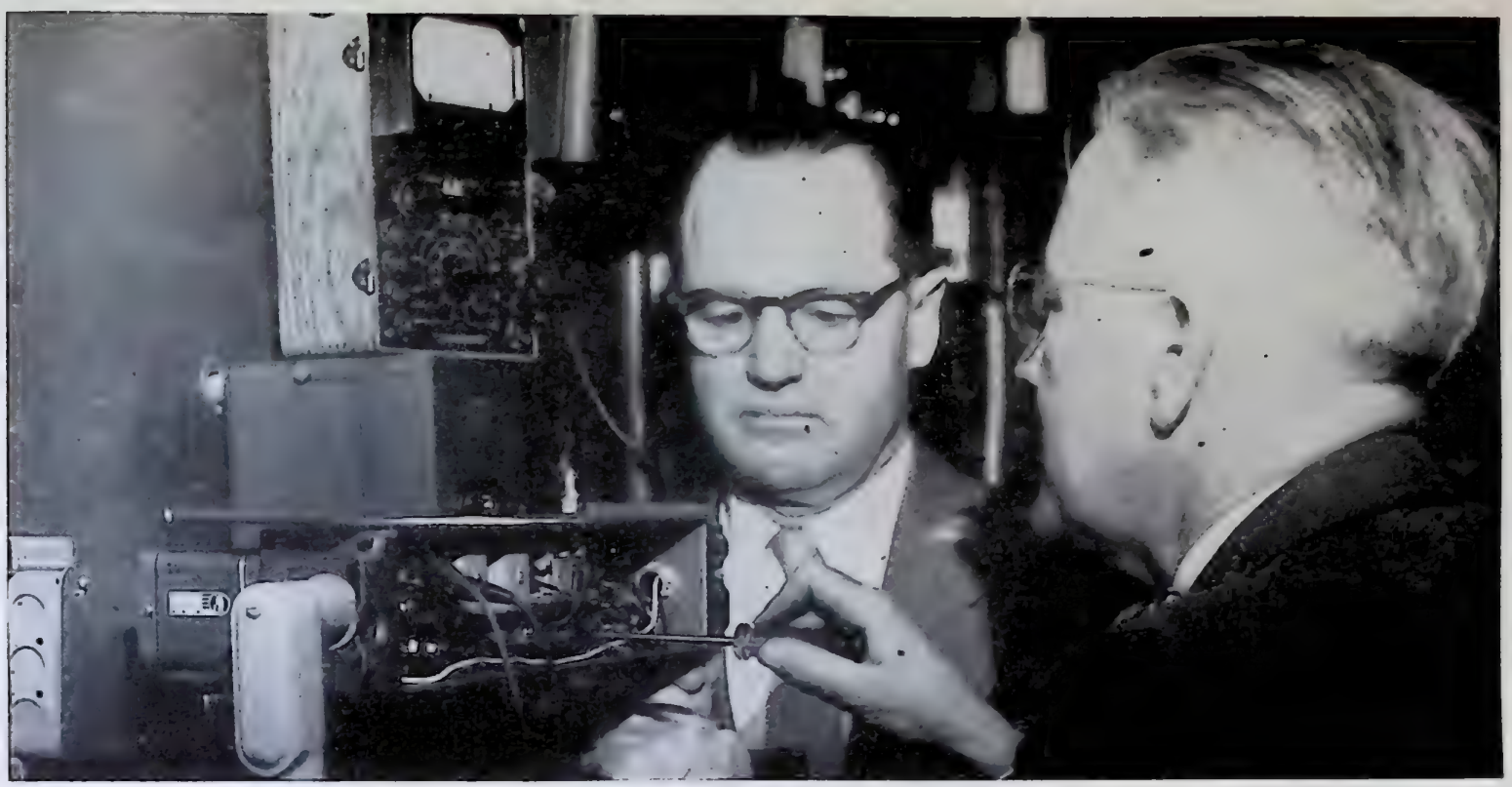


HERE Brown checks for magnetization in film gate of projector mechanism with small compass. The problem of magnetized magnetic sound tracks can be serious, and early detection is important.

An Important Factor

We believe that E. O. Wilschke, operating manager of Altec Service Corporation, the man who directs the activities of the company's far-flung field engineering forces aptly summed up the secret of Altec's success in the service field when he said recently: "It seems to me that Altec's engineering research and development operations are the most important factor in building and maintaining the reputation we have achieved. While the research and study which affect the tasks we perform in installing, servicing and maintaining sound equipments are not visibly apparent, they are constantly reflected in the results accomplished by our field engineers in analyzing and solving extremely difficult technical problems characteristic of today's complex and delicate sound equipments. All Altec field engineers are Altec-trained, steeped in the knowledge, tradition and pride of accomplishment which distinguish all of our efforts. Due to a system set



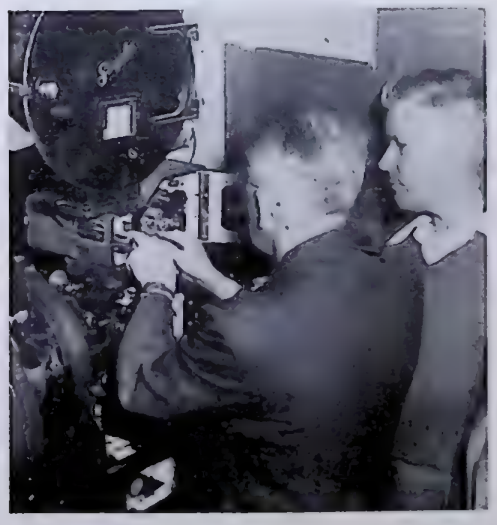


HERE Brown adjusts switcher amplifier which mutes the auditorium speakers when not in use. This procedure helps eliminate background noise.

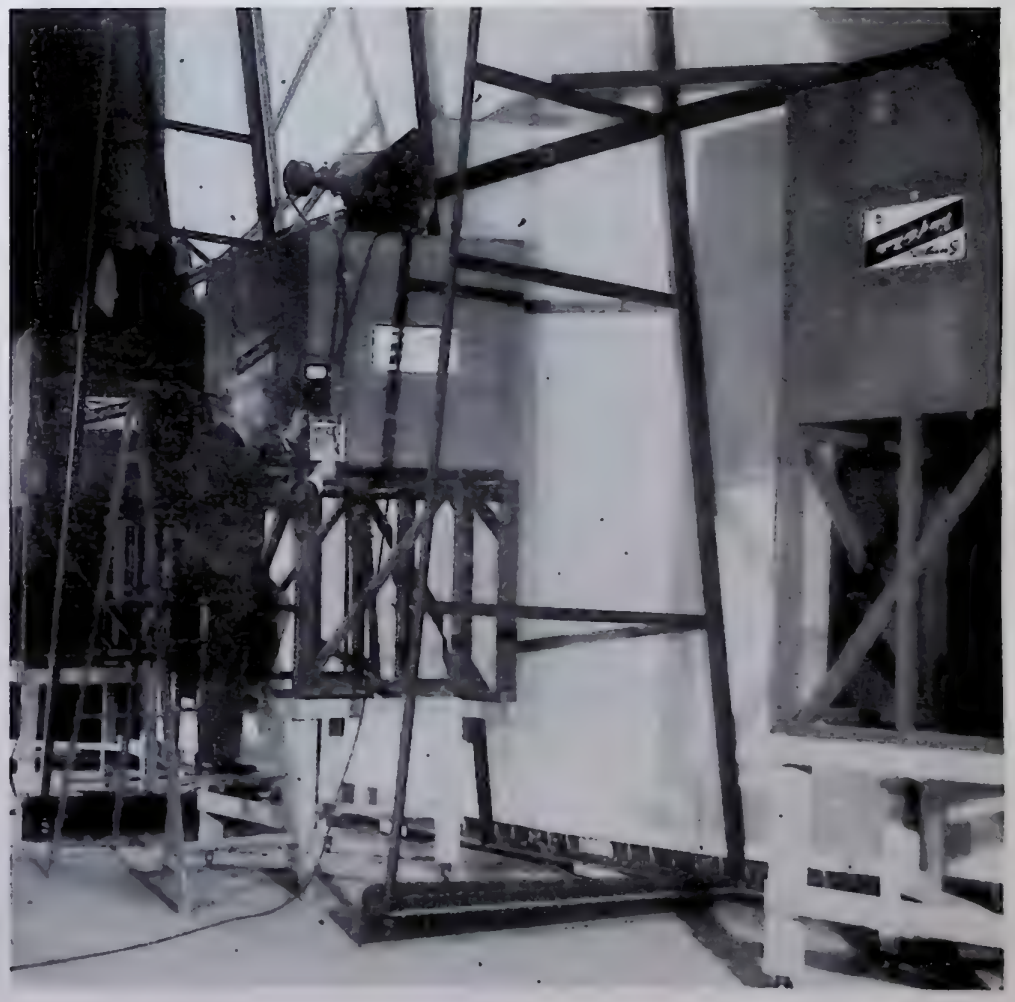
up early in our career, every bit of available information and knowledge gained on every job we do is interchanged among our division managers, branch managers, field representatives and more than 200 field engineers. Thus the inspection and servicing of a piece of sound equipment which may pose a problem momentarily is solved by our field experience, which is documented for the reference and use of all of our men."

Kept Pace

We have said that Altec service has kept pace with the technical developments which have revitalized an industry beset by devastating forms of competition. We would like here to document this statement by pointing up just a few of the steps Altec has taken to keep abreast of the changing scene in the field of service. In the era preceding the advent of Cinerama, CinemaScope, Perspecta and other accepted new sound techniques, Altec was known and respected for the array of special instruments and tools with which all company service engineers were equipped. The changing service scene has required new tooling, new instrumentation. In the service automobile of every Altec field engineer today may be found an assortment of tools and instruments especially designed for use in analysis, testing, adjustment and repair. Many of



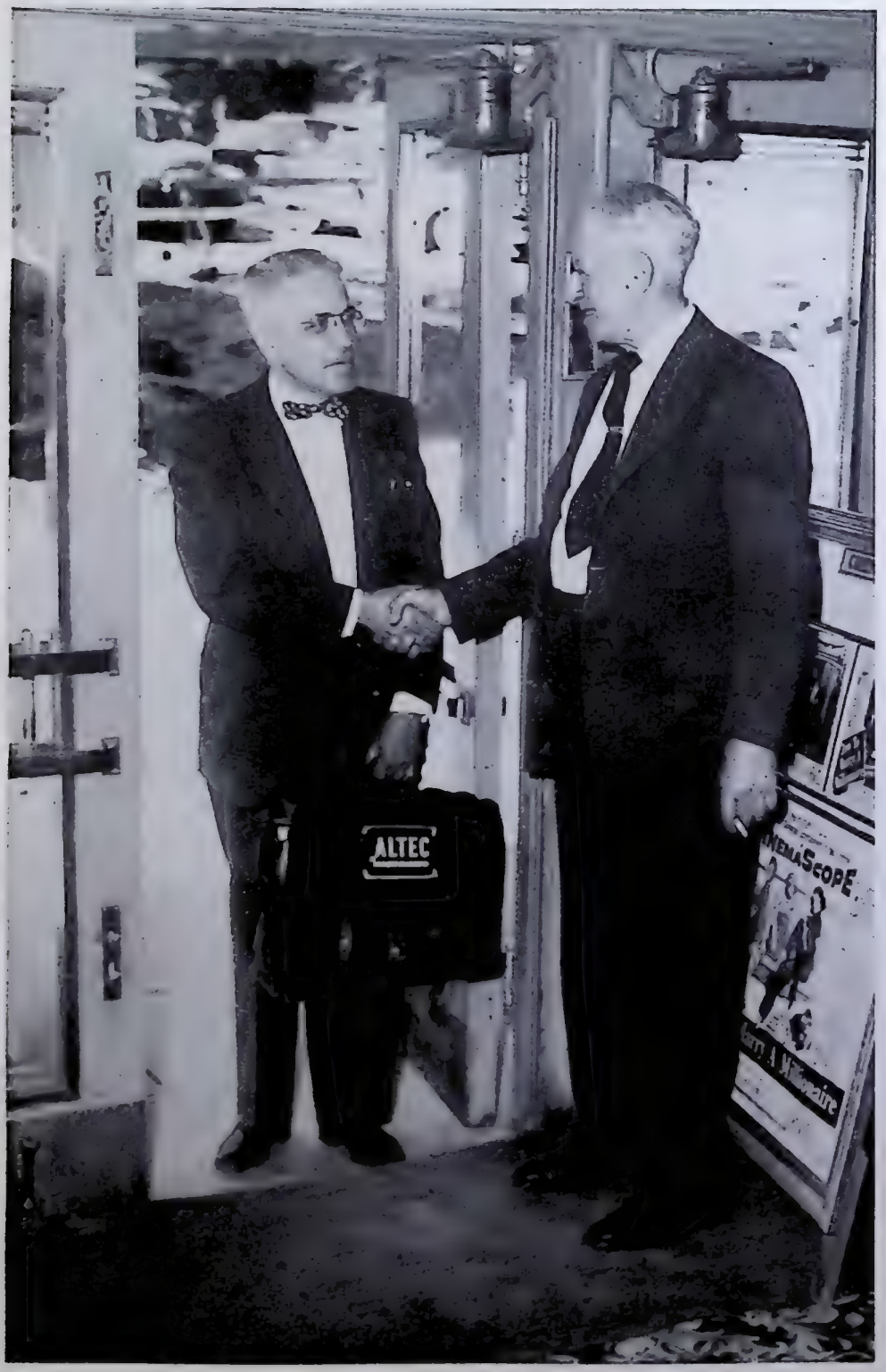
THE PROJECTIONIST (above) looks on as Brown shows how to check sound prior to threading up. An important part of stereophonic sound service is phasing (right) of the three stage speakers.



these electronic devices have been manufactured by Altec to their own design and specification. In the photographs illustrating this article may be noted the use by Altec service engineers of meters for transmission tests, Altec's As1800 all-purpose meter, an extremely small compass to detect and localize areas of magnetization, the DeGauser gun to eradicate magnetization, the Altec 1600 oscillator, used to check networks, explore frequency range, measure impedances, and perform various other service operations. The service kit of an Altec service engineer also contains another special service instrument carried by Altec field men. This is the Decabridge. Designed by Altec for use in conjunction with the company's 1800 all-purpose meter, the Decabridge provides all the facilities, other than test film and meter, required for making transmission tests efficiently, and for testing all types of condensers.

Mention of test film brings out another facet of the equipment provided to assure maximum results on the part of our field engineers. Every Altec service man has available to him 12 different types of test films. In the forefront of these special film rolls today are two frequently used clips; a CinemaScope test film used to determine the presence of sound in the penthouse reproducer, and a special film devised by Altec to determine the presence of magnetic fields in mechanisms, two procedures which insure trouble-free presentation. Other Altec test films include one for Perspecta installations, dealing with proper frequencies and adjustments, together with a variety of test films, both optical and magnttic, for transmission checks, sound lens adjustment, level balance, guide roller alignment, etc.

THE GENUINE smile of welcome on the face of this exhibitor as he greets the service engineer is an indication of the valuable work that these men perform. With the increased demands of stereophonic sound it is more important than ever that the sound systems of large and small theatres be in tip-top condition.



Close Knit Organization

Buttressing the activities of the Altec field crew of 200 qualified sound and service engineers is a closely knit operational organization directed by E. O. Wilshke, operating manager, who guides the operations of six division offices and 31 branch offices and stock points located strategically in key cities throughout the United States. Coverage of Altec service customers, a vital requisite for quick, efficient service, is assured by locating field men at those points best calculated to embrace the various centers of theatre concentrations. Constant contact is maintained between division offices, branch offices and the engineers in the field. Maps, with vari-colored indicators, are employed to indicate the location of every theatre, Altec-serviced or otherwise, in every territory, together with the exact location and availablity of each Altec field engineer. Each branch and division office maintains an up-to-date library of technical information dealing with all phases of motion picture sound. These reference volumes, together with the Altec Service Manual, are used as valuable adjuncts to the service Bulletins issued regularly to all members of the field engineering staff.

All Altec division and branch offices maintain elaborate test equipments for the immediate and proper evaluation of theatre sound components which require attention and repair, and all offices and stock points carry a complete supply of parts necessary for replacement work.

CONCLUSION

To convey an idea of the scope of Altec service operations, it has been estimated that the company's staff of more than 200 field engineers travel more than 5,000,000 miles yearly in the performance of their duties in the interests of 6,000 exhibitors from coast to coast. That Altec's service and maintenance staff has kept pace with the changing scene in the field of theatre sound is attested to by the fact that our company engineers have been called upon to supervise, in association with 20th Century-Fox, many of the CinemaScope trade showings and theatre premieres, and have performed a like service more recently for some of the industry presentations of Perspecta Sound. Altec is presently engaged in the technical supervision of installation of Perspecta units in numerous Loew theatrts, and is maintaining a high rate of installation and service for both CinemaScope and Perspecta in various theatres throughout the United States.

The Picture Brightens

Summary of the Early Development of One of the Leading Carbons and Its Role in Lighting New Screen Dimensions

By EDWARD LACHMAN
President, Lorraine Carbons, Inc.

BRIEF: ***Without the proper amount of light on the screen . . . all of the wonderful entertainment put on film . . . and the various methods of projecting this film . . . would all be worthless . . . Therefore . . . the arc carbon is certainly one of the most important items in the motion picture theatre.***

This article gives some interesting historical background on the development of carbons . . . It discusses the manufacturing process . . . and various safeguards that are used to insure the uniform quality of the finished product . . . There is valuable information about the various size carbons available . . . and what each is designed for . . . as well as a valuable section devoted to the use of carbons by the projectionist.

The world's first arc carbon industry came into being in the year 1877, when a Frenchman, Ferdinand Carre (founder of the Lorraine arc carbon industry), laid down the principles and succeeded in establishing industrial production of arc light carbons. Prior to the year 1877, the electric arc, discovered by Davy in 1810, had remained a curiosity of the laboratory. All through the years, Lorraine carbons have been leaders in the world arc carbon market, and at present, are more than meeting the exacting requirements of CinemaScope and the huge, wide screen light problems for more and more brilliant, intense light with their new methods of manufacture and continuous research.

Manufacture

In Pagny, where the Lorraine Orlux Carbons are manufactured, new, electronically-controlled ovens have been installed that are so huge that they occupy the area of a large city block; and so well engineered that heat changes are registered on graphs and meters down to the most minute fractions of degrees. From the time that the carbons enter the ovens to the time they emerge, the heating and cooling processes are electronically controlled. Heat plays an important part in the processing of Lorraine Orlux Carbons. The baking ovens, or kilns, must be slowly brought to the proper temperature, and maintained for days at temperatures well above 2000 degrees F. This conditioning serves a double purpose of eliminating volatile matters from the material, and for the hardening of the shells so as to give them the necessary mechanical strength and unique electrical characteristics in order to resist the high temperatures they are to be subjected to in the lamps. The slow heating and cooling periods make for complete uniformity and eliminate cracks and splitting that can occur in carbons that are not so closely watched during this heat-conditioning time. Also, all Lorraine Orlux cored carbons are electronically radioscoped with the object of eliminating all those that show the slightest internal imperfections. This elimination is done automatically.

Exacting Requirements

Lorraine Orlux Carbons are sold world-wide, and must meet the most exacting requirements under all conditions. To make sure that Lorraine Orlux Carbons have a steadier and more even light distribution, spot checks are continually made during their manufacturing process. This phase of examination takes place in the large arc lamp test laboratory, where all types of lamps now in use in the world are gathered.

The important physical characteristics of Lorraine Orlux Carbons are that they have a larger core area, which enables better distribution of the light on to the screen. Also, all copper-coated Lorraine Orlux Carbons—and black carbons for the new, mirror reflecting lamps up to the 11mm size—have a star core. The 13.6mm high intensity carbons have a new, distinctive, patented inner serrated shell, whereby the core material rests upon the edges of the inner serrations. This new approach enables Lorraine Orlux Carbons to be one of the steadiest burning carbons yet obtainable. The vents, surrounding the core, enable an even flow of gases at the arc, making it possible for a steady, more brilliant light source.

Also, the new Lorraine Orlux Carbon trims are manufactured to absorb loads over and above their top recommended amperage ranges. Many exhibitors, with their present power equipment, can take advantage of these Lorraine extras, which — in many cases — is more than adequate to give them the additional light on the screen that they will require for the new screen ratios and CinemaScope. All that may be necessary is to increase the amperage and make slight feed control adjustments.

Amperage Range	Voltage Range	Arc Gap	LORRAINE ORLUX CARBON COMBINATIONS Positive	Grade	Negative	Grade
High Intensity Lamps — Alternating Current						
50	22	5mm	6 x 7	541-01C		
50-60	25-27	6mm	7 x 14	542C		
75-80	25-27	6mm	8 x 14	542C		
1 Kilowatt — Reflector Lamps — Direct Current						
40	27.5	5mm	7 x 12 7 x 14	541C 541C	6 x 9	545-20C
High Intensity — Reflector Lamps — Direct Current						
40-53	31-36	6mm	7 x 12 7 x 14	544C 544C	6 x 9	545C
50-70	32-39	6mm	8 x 12 8 x 14	544C 544C	7 x 9	545C
Super 8's						
68-75	36-39	6mm	8 x 12 8 x 14	544-10C 544-10C	7 x 9	545C
65-75	35-38	6mm	9 x 14	544C	7 x 9	545C
Super 9's						
75-85	39-41	7mm	9 x 14	544C	8 x 9	545C
High Intensity — Reflector Lamps — New Type						
80-90	50-55	10mm	9 x 17½ 9 x 20	552-09 552-09	5/16" x 9	557C
95-110	53-58	11mm	10 x 20	552-09	11/32" x 9	557C
115	62	11mm	10 x 20	552-09	3/8" x 9	557C
115-130	60-64	12mm	11 x 20	552-09	3/8" x 9	557C
High Intensity — Condenser Lamps — Regular and Super High						
130-150	67-68	21mm	13.6 x 22	553-01	7/16" x 9	557C
140-170	68-72	22mm	13.6 x 22	523	1/2" x 9	555C
170-190	69-73	24mm	13.6 x 22	583-08	1/2" x 9	555CN
Some mfgrs. recommend width of negative as minimum arc gap.						
Low Intensity — Reflector Lamps — Direct Current						
15-28	45-55	3-5mm	12 x 8	252	8 x 8	257

TO OBTAIN maximum screen light keep intensity near the recommended maximum, and maintain proper amperages, voltages, and arc gap.

Sizes Available

Drive-ins and large screen theatres have found the Lorraine Orlux 13.6mm by 22 inch new Grade 523 Positive, with the inner serrated shell, and Lorraine Orlux 7/16 by 9 inch Grade 557C Negative, as well as the Lorraine Orlux 13.6mm by 22 inch new Grade 583-08 Positive, with the inner serrated shell, and Lorraine Orlux ½ by 9 inch Grade 555CN Negative, to give an evenly distributed brilliant light on the screen, more intensely than was possible just a year ago.

For the new high intensity, mirror reflecting type lamps, Lorraine Orlux Carbons have pioneered the development of newer and better 9mm by 20 inch Grade 552-09 Positives and 5/16 by 9 inch Grade 557C Negatives; 10mm by 20 inch Grade 552-09 Positives and 11/32 by 9 inch Grade 557C Negatives; and 11mm by 20 inch Grade 552-09 Positives and ⅜ by 9 inch Grade 557C Negatives.

All copper-coated Lorraine Orlux Carbons have been manufactured to give not only economical burning, but also to give increased light. This also is true with regard to CinemaScope and wide screen ratios of 1.75, 1.85 and 2 to 1.

Many small theatres with 1 K.W. operation found that their light was more than adequate for wide screen and CinemaScope application when Lorraine Orlux Carbons were used.

This "more light feature" has been found to be true with all of the new Lorraine Orlux Carbons.

Resetting Positive and Negative Feed Controls

Assuming that most projection equipment in the theatre—such as lamps, generator, or rectifier—is operating at its proper rating for the size of the carbon to be used, Lorraine Orlux Carbons will take the following minor adjustments after a "burning in" time of about two minutes.

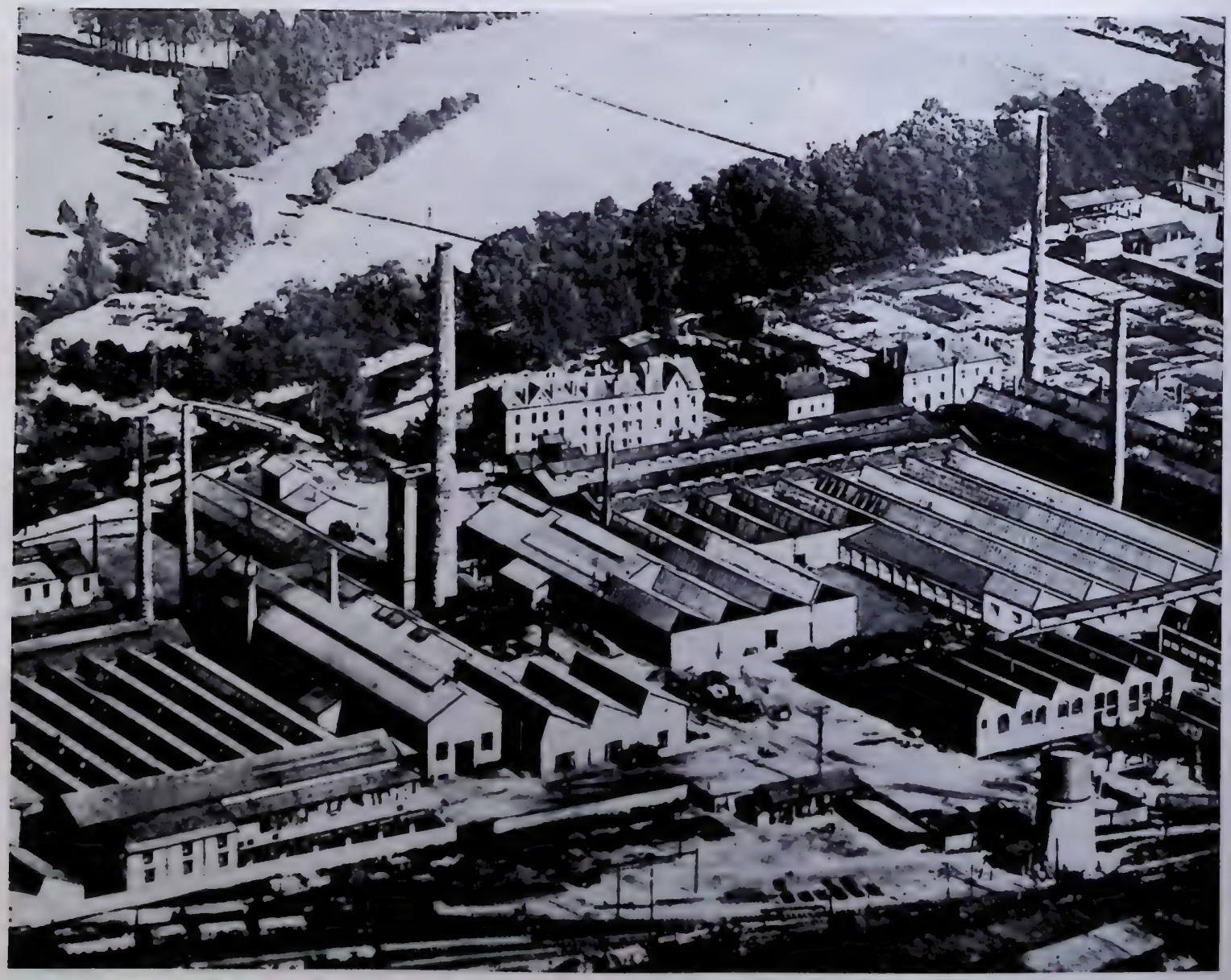
Usually it is necessary to reduce the positive carbon feed control rheostat, and the negative feed control on the lamphouse. It may also be necessary to change the height control on the negative carbon holder in order to burn the positive carbon squarely, and in order to have a proper crater in the positive carbon.

Reasons for the foregoing adjustments are that the Lorraine Orlux Carbon burns slower, and if adjustments are not made, the carbon will creep forward and freeze, forming what is called a "mushroom" on the negative carbon. It is important that the controls be turned slowly, and given sufficient time between each adjustment, to allow a new crater to be burned in the positive carbon. The projectionist, by watching the carbon visual crater card, can see the amount of creepage taking place on either the positive or negative carbon; and he can reduce or advance the controls accordingly, so that the positive and negative carbon will hold in their proper positions.

Unstable arc flames, causing a great amount of flickering or sputtering, may be attributed to one of the following:

1. Loss of magnetism of the permanent magnets controlling the flame.
2. Improper draft. All exhaust ducts should be equipped with a good exhaust blower and a damper to each lamp, to control the amount of air exhausted.
3. Moisture. Carbons must be absolutely dry before using; otherwise sputtering will be experienced. Since all carbons absorb moisture, pre-dry carbons in the lamphouse, or on the rheostat before using.

AERIAL photograph of the factory and warehouse of the Lorraine Carbons Co., Inc., at their Pagny sur Mossele, France location. This is one of the storing-manufacturing sites where the new Super-Orlux carbons are made and housed. The finest of equipment is used to ensure perfect uniformity.



A Lamp for the New Dimensions

A Description of the National Excelite Projection Arc Lamp and Its New Design to Meet Demand for More Light

BRIEF: *Regardless of whether it was three-dimensional films . . . CinemaScope . . . VistaVision . . . or any other new projection process . . . all of the newly developed and perfected techniques have demanded one thing . . . and this was more light on the screen . . . This need for greater screen illumination was an important one . . . The theatre industry has been fortunate in that the manufacturers and dealers who service the theatres have always been able to come up with the answer to any major problem . . . and this case has been no exception.*

This article gives a complete description of the new National Excelite projection arc lamp . . . The new construction features are explained . . . and the reasons for any changes and innovations are put down in a manner that any theatre operator will be able to follow . . . The subject of carbons . . . reflectors . . . operation of the lamp . . . and maintenance are also given thorough attention.

By J. W. SERVIES
Vice-president, National Theatre Supply

The several new types of projection systems which have been accorded quite general adoption have introduced the need for a wider range of screen illumination than was necessary with practices common for so many years.

In many cases it is practical, even necessary, for a theatre to have a light output of 15,000 to 17,000 lumens for a particular type of screen presentation one night, whereas the following night there may be needed 26 000 lumens for a different type of presentation.

All things being equal, when projecting a 2-1 aspect ratio with the wide-screen type of presentation wherein the short focal length lenses are used, there is required approximately 45 per cent more illumination than with the old standard 1.33 to 1 aspect ratio.

The efficiencies of the CinemaScope system are such that the light requirements over and above the old type of standard projection are not particularly excessive. However, in view of the fact that the single film type of 3-D presentations are coming into some favor, due to the increased excellence from a technological standpoint, the amount of illumination has to be appreciably increased over and above that required for CinemaScope or VistaVision or the other wide-screen techniques.

THE EXCELITE projection arc lamp has been so designed that it is capable of supplying light necessary to properly show the new dimensions.

Carbons Improved

There has been made available within the last year two new carbons for use in rotating feed reflector-type projection arc lamps, the 11 mm. regular type and the 10 mm. Hitex type. They have enabled gains in screen illumination of up to 30 per cent over that which was obtained with the 9 mm. and 10 mm. regular carbons, extending the range of lumens that can be supplied from 15,000-21,000 to an overall range of between 16.000 and 26,000 lumens.

The Excelite lamp, due to the foresight of the manufacturer, was designed with built-in interchangeability features, so that slight modification permits taking full advantage of these late carbon developments. Excelite type lamps being the type which permits this easy interchangeability without sending the lamp to the factory for rebuilding, have naturally come into very wide use. Provisions have been made whereby Excelite lamps can be quickly converted to meet the various modes of modern day presentation. Only four components need be changed to accomplish the various switches.



Simple Conversion

The positive motor feed of the Excelite contains a 216 to 1 integral gear reduction. This reduction is easily increased to 300 to 1 for proper burning for the 11 mm. carbon. The second interchange is in carbon contacts. The 11 mm. contacts are used for 11 mm. carbons and the 10 mm. contacts handle either the 10 mm. regular or 10 mm. Hitex carbon. One set of positive drive rollers operate to feed the 9 mm. or 10 mm. carbons and another is available for the 11 mm. carbon.

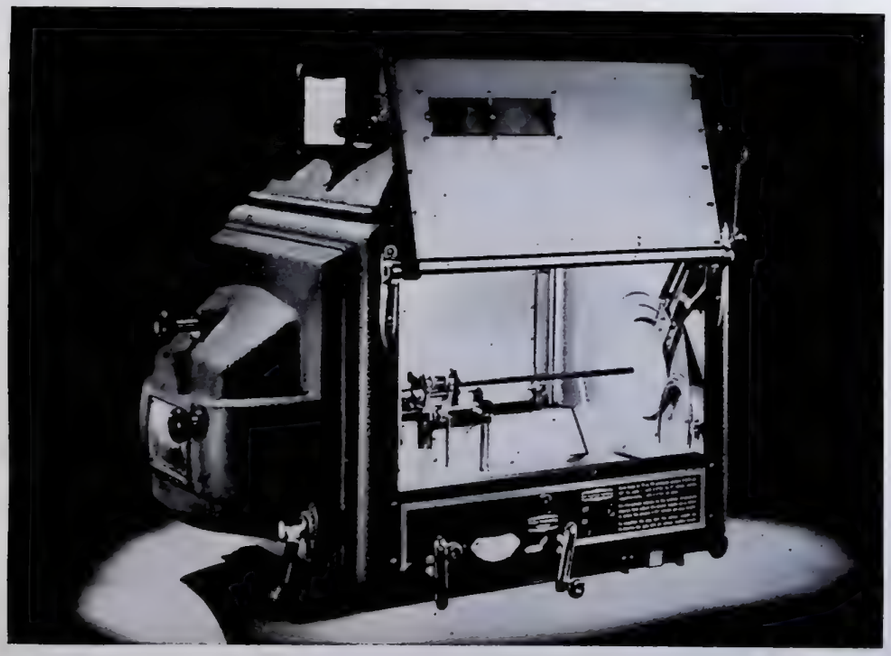
The other component is the feed for the negative carbon. As the negative carbon increases in size for use with the higher currents that are burned, the burning rate of the negative becomes slower. The average burning rate for a negative carbon of five-sixteenths or eleven thirty-seconds inch diameter, such as used between 75 and 105 amperes, is about three and one-quarter to three and one-half inches an hour. With the three-eighths or seven-sixteenths diameter carbon needed for burning between 115 to 135 amperes, the average burning rate is two and one-half inches an hour. This difference in the burning rate in the negative necessitates the interchange of the negative lead screw which feeds the negative carbon. A change to six and one-quarter thread lead screw in place of the 5-thread lead screw which is furnished for use at the lower amperage, is required. These four components can be interchanged on the lamp, converting it from one range of current to another in a matter of approximately 20 minutes.

Glass Reflector

The development of the Excelite lamp took into account the fact that at higher currents there was a considerable strain placed on the glass reflector from the standpoint that the arc flame was in close proximity and also that products of combustion released from the burning arc were apt to collect on the reflector thereby reducing its reflectance and through absorbance of more heat result in breakage. When the design of this lamp was contemplated a provision was made whereby a stream of air was directed over and above the arc for a three-fold purpose;—first, to stabilize the arc and maintain a prescribed system of ventilation of the area surrounding the arc that was not subject to the external draft conditions of the smoke pipe; secondly, to chop off the tail flame and prevent it from reaching toward the reflector, thereby cutting down the heat that reached the top of the reflector; thirdly, to supply enough oxygen in the vicinity of the arc so that no black soot is produced as a byproduct, particularly when the arc is struck, and to keep the white soot, product of combustion, from collecting on the reflector in any quantity that wold be sufficient to absorb heat and cause breakage.

Another New Feature

Another feature that was engineered into the Excelite is the automatic crater positioning control system which insures that both carbons are fed in the correct proportion to maintain a correct arc gap length and to keep the position of the positive crater in the exact focal point of the reflector. This insures that throughout the presentation on the screen the light will always be of the same color, without variations from white to either blue or brown. This automatic positioning system is the very essence of simplicity. It entails no photoelectric cells, with their complicated amplifiers, but rather makes use of the fact that the arc itself has sufficient energy to directly drive the contacts which are operated by a bimetal lever. This lever is sensitive to the heat image of the arc as projected on the compensated bimetal element. The bimetal element and contacts in turn control the speeds of both the positive and negative motors in such a fashion that the total carbon feed remains practically a constant. Variation is made in such a way that when the positive carbon is speeded up to correct a slight error in position in relation to the reflector, the negative carbon is correspondingly slowed down so that the light on the screen will remain a constant and of the same value. Inferior carbon positioning systems could be devised which would take effect on the positive carbon only but they would change the volume of light on the screen when the compensating action was taking place.



THIS LAMP has an automatic crater positioning control system which insures proportion to maintain a correct arc gap length and to keep the position of positive carbon crater in exact focal point.

Variable Ratio Feed Lamp

The Excelite is a variable ratio feed lamp; that is, it can be set by the operator to feed at any current. Variation as desired in the arc-amperage can be easily obtained as there is the necessity of operating only one chief control adjustment on the lamp, the direct result of the positioning system controlling both of the feed motors. It is only necessary to operate one control which is calibrated in inches of speed of positive carbon per hour. The operator can set this control so as to make most economical use of the carbons consistent with the length of the reel he is projecting. If the screen is of such a size that sufficient illumination is obtained for three double reels from a positive carbon and a reel runs 18 to 20 minutes the carbon burning rate control can be set at approximately 17 inches positive carbon feed per hour. Thus there is automatically obtained three double reels from one positive carbon as the Excelite will burn about 17 inches of positive carbon continuously out of a 20 inch carbon. It there are one or two reels which run 23 or 24 minutes by simply turning this carbon feed selector to a lower rate, say approximately 14 or 15 inches per hour, it is possible to sufficiently extend the life of the carbon. This adjustment can be made at any time and while the arc is burning without separately setting up the feed of both the positive and negative carbons as would be necessary with older type lamps. Also in the case of running short of carbon in the trim and when there is only enough to last 10 minutes and the reel has 12 minutes to go, the rate of the feed can be slowed from 17 inches an hour to 14 or 15 inches an hour, and thereby get enough burning time to finish the reel without running out.

Such rapid changes in the burning rate of the positive carbon, to enable the projectionist to use carbons more efficiently, are not possible on older type lamps because you also have to change the burning rate of the negative carbon, and such adjustment requires from five minutes to half an hour, depending on the skill of the projectionist. On the Excelite lamp there is only the one

calibrated control and no guesswork involved.

A most obvious advantage of the automatic crater positioning system is that it frees the operator from the necessity of constantly supervising the arc. This is a great boon to the operator particularly with the new projection systems which require a great deal more attention than the older projection systems. Due to the fact that the positioning of the positive crater is taken care of automatically, he is assured that he has a white light on the screen at all times and, relieved on this score, he can devote himself to the care of other technical features of projection which are not on an automatic basis and which require continual attention. It is a tribute to the excellence of the Excelite that many exhibitors have installed them in the last year solely for the reason that in their 3-D presentation it is necessary to maintain the light between the two lamps at a constant volume. In other words in this presentation each eye sees the light produced by one lamp and to obtain the 3-D illusion these lights have to be of constant color, the same power and same intensity.

Another tribute to the Excelite is in the case of Cinerama wherein three projectors are operating simultaneously to project on one screen. Here small color differences would be readily apparent as well as small differences in the intensity of illumination. Here again the Excelite lamp was chosen because of its excellence in maintaining constant color and constant illumination intensity. Further proof of the excellence of the Excelite lamp lies in the fact that it was chosen for the world premiere of "The Robe" in CinemaScope in the Roxy Theatre in New York City, where several different types of older lamps have been tried and found deficient in desirable qualities for this presentation.

Simplified Construction

The construction of the Excelite is straightforward, simplified. With individual motors each feeding one carbon, the feeding arrangement is simplified to a great extent and does not necessitate any kickoff feed device from one carbon to the other such as ball clutches or other methods of taking the variable feed for both carbons off of one motor. Each carbon feed is derived from its respective motor through a geared down reduction head which is integral with the motor and this shaft is coupled direct to the carbon feed heads themselves.

Filter

The Excelite 135, with its greatly expanded light output, makes the use of a heat filter necessary, so the manufacturer furnishes the Reflect-O-Heat filter as standard equipment. This dichroic type filter makes use of numerous interference layers which are deposited by vacuum process on pyrex glass and which have the peculiar property of selectively reflecting unwanted heat portions of the energy from the aperture. This filter allows the wanted, or visible, portions of the energy spectrum to pass through, while reflecting back and away from the film the undesirable and unusable portions of the energy spectrum, thus allowing the film to run in the projector without buckling or damaging when the high intensities are utilized. The point where it becomes necessary to insert the filter in the beam to project the film varies with the individual projector and with the type of film that is being projected. Generally speaking, for amperages of 110 or above, the use of this filter is mandatory, to insure against film damage.

The design of the Excelite is such that it is very easy to keep the lamphouse clean from soot and carbon ash. The entire rear door of the lamphouse swings open and the entire bottom of the lamp can be brushed out through the rear door so that any carbon ash deposit which collects in the base of the lamp can be swept out without any danger of sweeping it into the interior mechanism of the lamp, and thereby causing feeding difficulty.

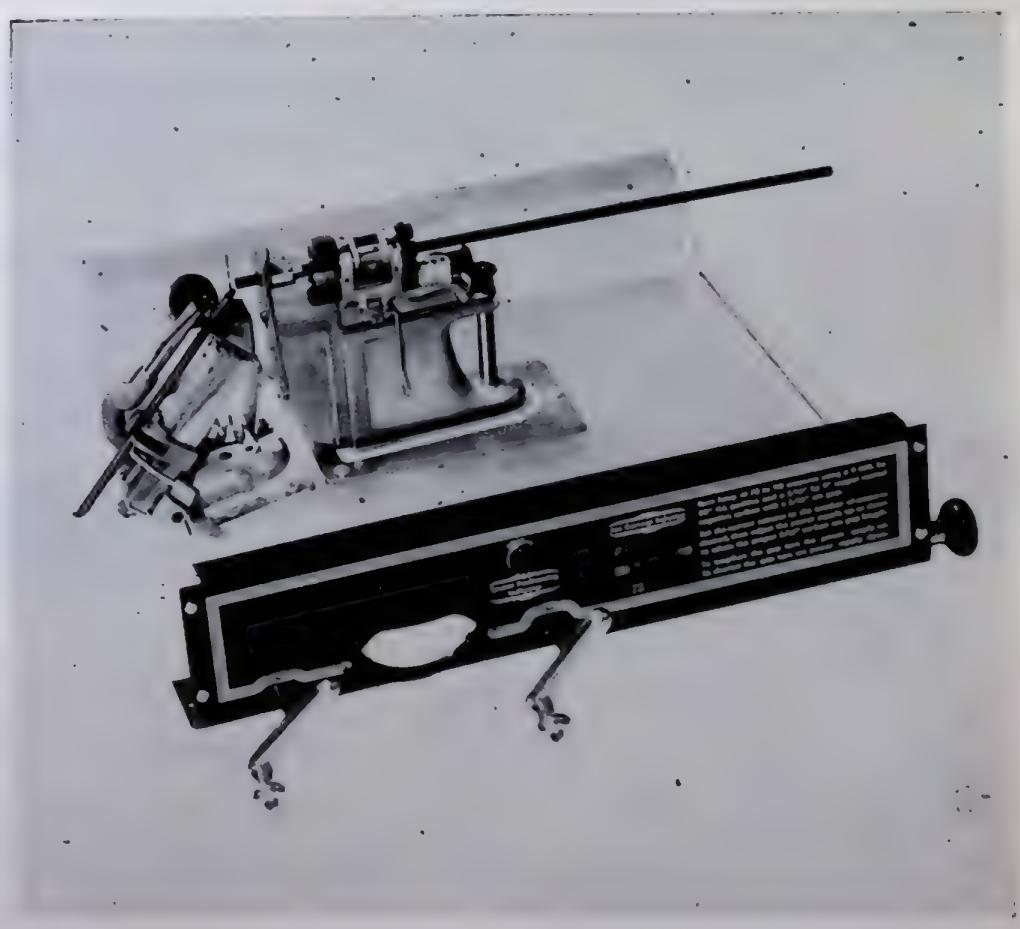
Easily Maintained

Beyond the fact that it makes for easy interchangeability of the various elements so as to burn different currents in the lamp, unit construction permits easy removal of the elements for inspection in servicing. The operator is able to remove any part and interchange it with similar units from a spare lamp or to make quick repairs on the bench where the operator can get at the seat of the trouble without the necessity of taking the whole lamp apart. These interchangeable parts are generally fastened by a minimum number of quick fastening screws or, in the case of the control tube, by simply unplugging from the socket in the manner in which you remove a vacuum tube from a radio set. The control relay is removed very easily, being mounted on a tube socket base. The positive and negative heads are mounted separately to the base by means of quick fastening screws and either of these assemblies can be removed in about 30 seconds. The negative and positive motors are likewise fastened by three screws and the electrical connection to the motor is broken by simply pulling out by a three prong plug.

The motors are lubricated and sealed, consequently there is but little exposed gearing susceptible to abrasive carbon dust collection. The fact that these gears are sealed in the head of the motor reduces the frequency of necessity for lubrication.

The parts near the positive feed head are all easily accessible from the outside of the lamphouse and can be lubricated in a matter of seconds. Each of the feed motors has a fan mounted on its motor shaft. Air from these fans is led into the lamphouse where it keeps the entire base under pressure. The air can be withdrawn from the base through the heads and up through the air stream tube which projects the air over the arc. The air which is allowed to escape up through the positive head aids in keeping this positive feed head operat- at low temperature.

The Excelite 135 is a most economical lamp in terms of carbon and current consumption for producing screen illumination in the range of 20,000 to 25,000 lumens.



VIEW of the burner mechanism. This is a variable ratio feed lamp that can be set by the operator to feed at any current needed.



AN EXTREMELY BRIGHT SPOT

STRONG TROUPER
FULLY AUTOMATIC
ARC SPOTLIGHT

Adjustable, self-regulating transformer in base. A powerful, sparkling, flickerless spot—sharp edged from head to flood. Silvered glass reflector.



6-½ TIMES BRIGHTER HEAD SPOTS

STRONG TROUPERETTE
INCANDESCENT
SPOTLIGHT

Horizontal masking control angles 45 degrees in either direction. Fast-operating, 6-slide color boomerang. Two-element variable focal length objective lens system.



BRILLIANT SLIDE PROJECTION

STRONG UNIVERSAL
HIGH INTENSITY ARC
SLIDE PROJECTOR

Brilliant projection of 3-1/4" x 4" slides. With adaptations, 2" x 2" slides.



THE PREFERRED RECTIFIERS

A complete line of selenium plate and tube type rectifiers, one for every type of lamp. The only rectifiers especially designed, manufactured and tested in one plant, together with and for use with motion picture projection arc lamps. Assure smooth output current, long life, low operating temperature, and flexibility in control.



PRECISION REFLECTORS

Long recognized for their superiority, carefully produced in types and sizes for use in all standard projection arc lamps. Regularly stocked for immediate factory shipment.

THE STRONG ELECTRIC CORPORATION
87 CITY PARK AVENUE — TOLEDO 2, OHIO

Why Strong Lamps Are Different

WHY THEY ARE USED WITH MOST CINEMASCOPE PRESENTATIONS

Best possible screen lighting is a major objective—the most light, evenly distributed, of constant intensity, and unchanging color value. These exacting high standards have been realized with the development of Strong's exclusive Lightronic crater-positioning system which automatically maintains the position of the positive arc crater at the EXACT focal point of the reflector. Manual adjustments, which at best lead to uncertain results, have been made entirely unnecessary.

ALL YOU DO IS STRIKE THE ARC

The positive and negative carbons are advanced by separate motors, the speeds of which are governed by the Bi-metal Lightronic Tube. Once the arc has been struck, the crater position and gap length are maintained automatically, and without constant attention by the projectionist.

With the new presentation techniques complicating his job, the projectionist is particularly appreciative of this simplified control. Furthermore, he is quick to see the advantages of the unitized component design which affords such wide versatility in these lamps. He can in a matter of moments and right in his projection room effect the simple changes necessary to attain the correct light requirement for any of the various techniques. It is even possible for him to get the light requirements of two different types of techniques on the same program.

TRUE VERSATILITY

A choice of four different carbon trims can be burned in a total of seven separate manners to attain any desired degree of cost of operation, screen illumination, or burning time.

SIMPLIFIED CONTROL

Only one control is required for selecting any amperage within the range of a particular mode of operation.

THE MOST POWERFUL LAMPS

Burning 10 mm "Hitex" carbons at 135 amperes, or 11 mm regular carbons at 120 amperes, impartial foot candle meter tests prove the Strong "Super 135" the most powerful projection arc lamp, and you can't argue with a light meter.

The Infra-Ban Beam-Cooler unit diverts the heat rays away from the aperture, making possible a tremendous increase in usable light without a corresponding increase in heat at the aperture.

A stream of air directed just above the arc stabilizes its burning and prevents the deposit of soot on the reflector.

Strong has also designed new rectifiers with a range of from 90 to 135 amperes to fill the power requirements of all the systems of screen presentation.

When the lamps are **STRONG** *the picture is bright!*

As the only lamps produced complete within one factory, Strong lamps can be screen-engineered for maximum efficiencies. That's why more dealers sell and more theatres buy Strong-made projection arc lamps than any other make.

Send today for full details on the Strong Super "135" and Mighty "90" projection arc lamps.
When the lamps are STRONG the picture is bright!

THE STRONG ELECTRIC CORPORATION

"The World's Largest Manufacturer of Projection Arc Lamps"

87 CITY PARK AVENUE — TOLEDO 2, OHIO

The Most Highly Regarded Sight and Sound Equipment

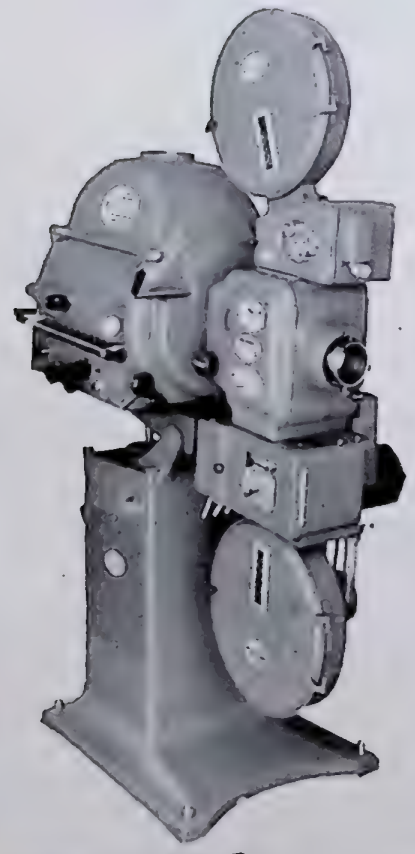
MOTIOGRAPH

For exhibitors and projectionists who are satisfied only with a perfect performance.

You'd expect such fine equipment to be expensive, but Motiograph offers it at a down-to-earth price, seldom higher than that of ordinary equipment.

Run CINEMASCOPE and Conventional Prints Without Changing Sprockets, Shoes and Tracks

The New MOTIOGRAPH AAA PROJECTOR



- ★ Instantaneous interchange of apertures.
- ★ Lens barrel, with no modifications, accepts lenses of all focal lengths with a small or large diameter. Anamorphic lenses quickly installed without adjustment.
- ★ Double-duty tension shoes, tracks, guide rollers and sprockets need not be changed to run conventional or CinemaScope prints.
- ★ Rollers at top and bottom of aperture prevent side sway.
- ★ Intermittent movement removable from operating side in a matter of seconds.
- ★ A rock-steady, clearly-defined picture.
- ★ Maximum screen illumination without flicker or travel ghost.
- ★ Gears run on lubricated-for-life, double-row ball bearings. Smooth, silent, cool operation. Unbelievable resistance to wear.
- ★ Blower, available for use with high amperage arcs, cools aperture and film.

No other projector affords so many exclusive features. Motiograph projectors have a reputation for lasting practically forever, assuring lowest maintenance cost. For perfection in projection you must have Motiograph—the finest projector in history.

Your Motiograph dealer will arrange a demonstration and explain a liberal financing plan.

EXPORT DIVISION
(Except Canada)
Frazar & Hansen, Ltd.
301 CLAY STREET
SAN FRANCISCO 11, CALIF.

Write Today for Free Literature

MOTIOGRAPH, *Incorporated*
"Since 1896"
4431 WEST LAKE STREET • CHICAGO 24, ILLINOIS

The Most Highly Regarded Sight and Sound Equipment

MOTIOGRAPH

for exhibitors and projectionists who are satisfied only with a perfect performance

You'd expect such fine equipment to be expensive, but Motiograph offers it at a down-to-earth low price which is seldom higher than that of ordinary equipment

Alert Exhibitors Know that High Quality Sound Pays Off at the Boxoffice



Save BIG Money on In-Car Speakers with Motiograph Speaker Unit Replacements for Your Present Speakers, or New Motiograph Rainmaster Speakers



The Only Projector Designed Especially for CINEMASCOPE and other short-focal-length lens, wide-screen processes



Completely Silent



Your Motiograph dealer will arrange a demonstration and explain a liberal financing plan

MOTIOGRAPH NOW PUTS IT WITHIN THE REACH OF EVEN THE SMALL THEATRE

The best-balanced, most complete tonal range . . . a guarantee of life-like reproduction, delicate shadings of voice, musical qualities never before approached, uniform sound level throughout the theatre.

Motiograph offers a complete line of sound equipment for indoor and outdoor theatres of every size. The Motiograph line includes models to reproduce single track optical, single track magnetic and perspecta sound prints, as well as three and four channel stereophonic systems.

Twenty, forty, seventy-five or 150 watt optical sound reproducing systems for indoor theatres containing Motiograph SH-7500 reproducers are available with a choice of 10 different sized loud speaker systems. Optical reproducing systems for the Drive-In are ten in number ranging in power output from 75 to 500 watts. Both 3 and 4 channel stereophonic systems are available with a choice of 20, 35 and 75 watt power amplifiers and ten different sized loud speaker systems. All models contain Motiograph AAA Penthouse Reproducers.

Motiograph stereophonic sound systems can be matched to any presently installed regular theatre sound system. The Motiograph AAA Penthouse Reproducer may be used with any modern projector mechanism.

THE SPEAKER WITH A RAINCOAT!

Doubles the Life of Speaker Units!

Slashes Maintenance Costs! The face of the speaker unit is protected by a taut, chemically impregnated linen cover which prevents moisture, dust or grit reaching the cone. Corrosion-resistant metal parts. Rugged dent-proof die-cast aluminum housing withstands roughest abuse. Light weight makes for easy handling. Fits virtually any make or model of junction box. Quality 4-inch permanently rattle-proof speaker unit assures exceptionally high fidelity sound.

The smart appearance of the speaker and junction box, white on silver finish with emerald green trim, will last season after season.

Only five parts. Quickly disassembled for maintenance. Two patented screws hold the housing together. Cannot be opened with coin, knife or ordinary screw driver.

The Motiograph Junction Box

Strong aluminum base casting quickly attached with one screw to pipe supports of from 2 to 2⅝", without using pipe flanges or threading pipe support.

Adjustable beam post lights optional. Thermial block light sockets, transformers and wiring protected from weather by aluminum covers and mounted higher than the floor of the base to protect them from condensed moisture.

Accommodate virtually all makes of speakers.

Multi-tapped transformers permit exact matching of speakers and amplifier circuit.

THE NEW MOTIOGRAPH AAA

- Instantaneous interchange of apertures for any process.
- Lens barrel, with no modifications, accepts lenses of any focal length and diameter.
- Double-duty tension shoes, tracks, guide rollers and sprockets need not be changed to run conventional or CinemaScope prints.
- Rollers at the top and bottom of the aperture prevent side sway.
- Intermittent removable from operating side in a matter of seconds.
- A rock-steady, clearly-defined picture.
- Maximum screen illumination for wide screen projection without flicker or travel ghost.
- All gears run on lubricated-for-life, double-row ball bearings. Smooth, silent, cool operation. Unbelievable resistance to wear.
- A separate blower, available for use with high amperage arcs, cools aperture and film.

Designed, engineered and built by projection specialists, no other projector gives you so many exclusive features. Motiograph projectors have a reputation for lasting practically forever, assuring lowest maintenance cost.

Perfection in projection requires Motiograph—the finest projector in history.

MOTIOGRAPH CONTINUOUS DUTY HI-POWER MOTOR GENERATORS

Models for providing a dependable power source for arc lamps operating at between 40 and 125 amperes and arc voltages of between 36 and 65.

EXPORT DIVISION
(Except Canada)
Frazar & Hansen, Ltd.
301 CLAY STREET
SAN FRANCISCO 11, CALIF.

Write Today for Free Literature

MOTIOGRAPH, *Incorporated*
"Since 1896"
4431 WEST LAKE STREET • CHICAGO 24, ILLINOIS

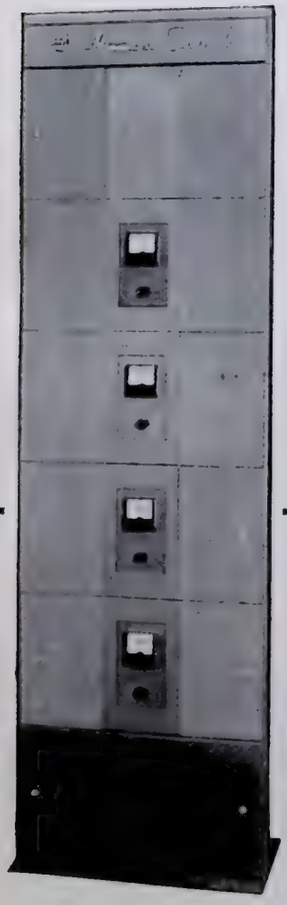


New RCA Speaker Design

New high-fidelity magnetic recording deserves the finest reproduction. Check the important RCA Speaker features that offer your patrons an all-new experience in theatre sound.

All-new high-frequency horns—new units offer 60° or 90° angle for perfect coverage of any house. New mounting system permits perfect aiming of horns. All-New Radial-Type Flare—mathematically correct horn shape spreads sound over the entire house. Same coverage pattern as high-frequency horns—another RCA "first." All-New Baffle—the first really new design offered to the industry in many years. All-New High-Power Driver Mechanism—power to spare for the large house and the small house. These new speaker mechanisms drive brilliant, realistic RCA Stereophonic Sound to every seat in your house.

Now! Complete RCA meets every

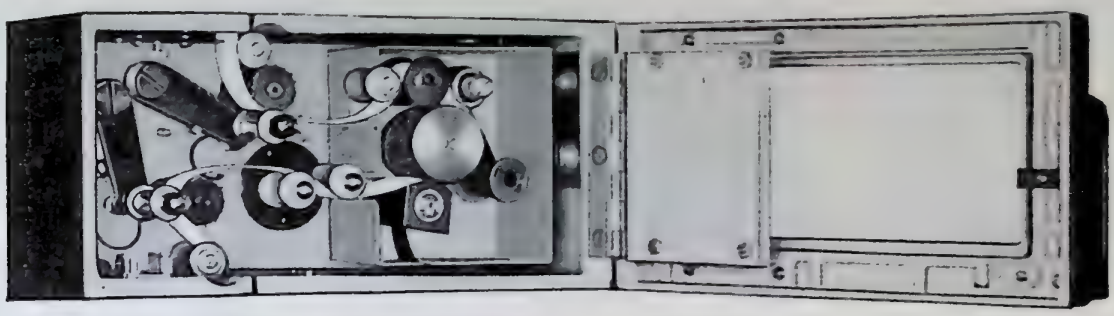


NEW RCA STEREOPHONIC SOUND

... the industry's lowest-priced quality system

Everything you want—convenience, brilliant performance, reasonable price, flexibility—they're all yours when you install RCA Stereophonic Sound with the new RCA Audio-Sync amplifier. Here's all of RCA's long theatre experience and technical background—translated into superb systems in every price range.

Amplifier systems powered to meet requirements of budgets and houses of all sizes. Newly designed space-saving racks ... in-wall mounting if desired. Instant accessibility for tube replacement and servicing. Convenient individual track and all-channel monitoring. Emergency channel switching. Built-In Tube Checking facilities in power amplifier. Full power output over wide frequency range. Front-Wall-Mounted Preamplifier, Volume Control and Changeover Unit.



New RCA "Button-On" Soundhead

Here is the final answer to the problems of stereophonic sound—the new RCA "Button-On" Soundhead. This compact unit fits easily on your present projectors—lets you show the new single-film, Four-Track features without changing standard projection procedures.

Four-Track magnetic sound feeds into four magnetic soundheads. Single film carries picture and stereophonic sound. Only one film to thread—only one film to watch. Precision Construction gets all the smooth, wide-range response that magnetic recording offers. Designed by experts in magnetic recording and all phases of motion picture recording.

stereophonic sound line budget need!

New RCA "Wide-Arc" Lamp

Here's RCA's answer to today's big light problems. Demonstrations on screens up to 70 feet wide prove it's everything you could ask for in big light power. For more light in drive-ins, for more light in 3-D and large-screen presentations, pour it on with RCA's "Wide-Arc" Lamp system.

New RCA "Dyna-Lite" Screen

Operators of small and medium-sized theatres are now experiencing new economy and new operating flexibility with RCA's all-purpose "Dyna-Lite" Screen. With this new, aluminized plastic screen, you show standard, 3-D and wide screen films on the same screen. Change screen size simply by opening curtains to the required width.

RCA Projectors for finest results from all the new types of films. The famed RCA "100" is still the finest mechanism the industry can offer.

See your local independent RCA Theatre Supply Dealer for details on these important, new RCA advances. He'll also be glad to talk with you about the full RCA line including carpets and chairs.

THEATRE EQUIPMENT
RADIO CORPORATION of AMERICA
ENGINEERING PRODUCTS — CAMDEN, N. J.
In Canada: RCA VICTOR Company Limited, Montreal

J·E·ROBIN, INC. ★ MARK OF QUALITY ★

GENERATORS · REC

POWER with a PLUS!

"ROBIN-ESCO Super-power"



MOTOR GENERATORS

The ROBIN-ESCO *"Super-Power"* motor generator, especially built for motion picture projection, is the ultimate in modern power-conversion equipment.

"Super-Power" is the (dependable) motor generator built to meet the maximum power requirements of any wide screen projection system.

"Super-Power" is engineered for operation on a continuous basis and is available in 60 volts—145 amperes, 80 volts—135 amperes and all other standard ratings.

Theatres and drive-ins recognize the quality and performance of *"Super-Power"* as the dependable, unfaltering power source necessary to meet modern projection practices.

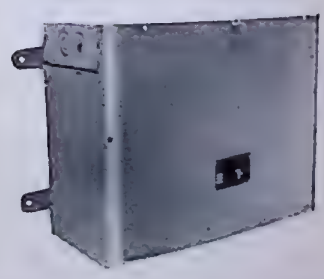
'ROBIN-ARC' 3-Phase Selenium RECTIFIER



Engineered for Wide Screen and 3-D Projection Systems

"Robin-Arc" Selenium Rectifiers are the ideal power source where reliability under severe overloads, low ripple and short circuit characteristics are vital. Correct use of Selenium Rectifier behavior and built-in reactance in iron-core components limit short-circuit current to a safe value.

"Robin-Arc" Model K-100 delivers continuously 100 A-62 V. from imputs of 190-250 V. 3-phase 50/60 cycle, and is adjustable from 36V to 62V in small increments. Standard units up to 180A and 80V with identical characteristics are available. The amazing new *"Robin Ro-Ro"* permits the operation of a standard 3-phase rectifier *from a single phase power supply.*



J. E. ROBIN, INC.

TIFIERS • SCREENS

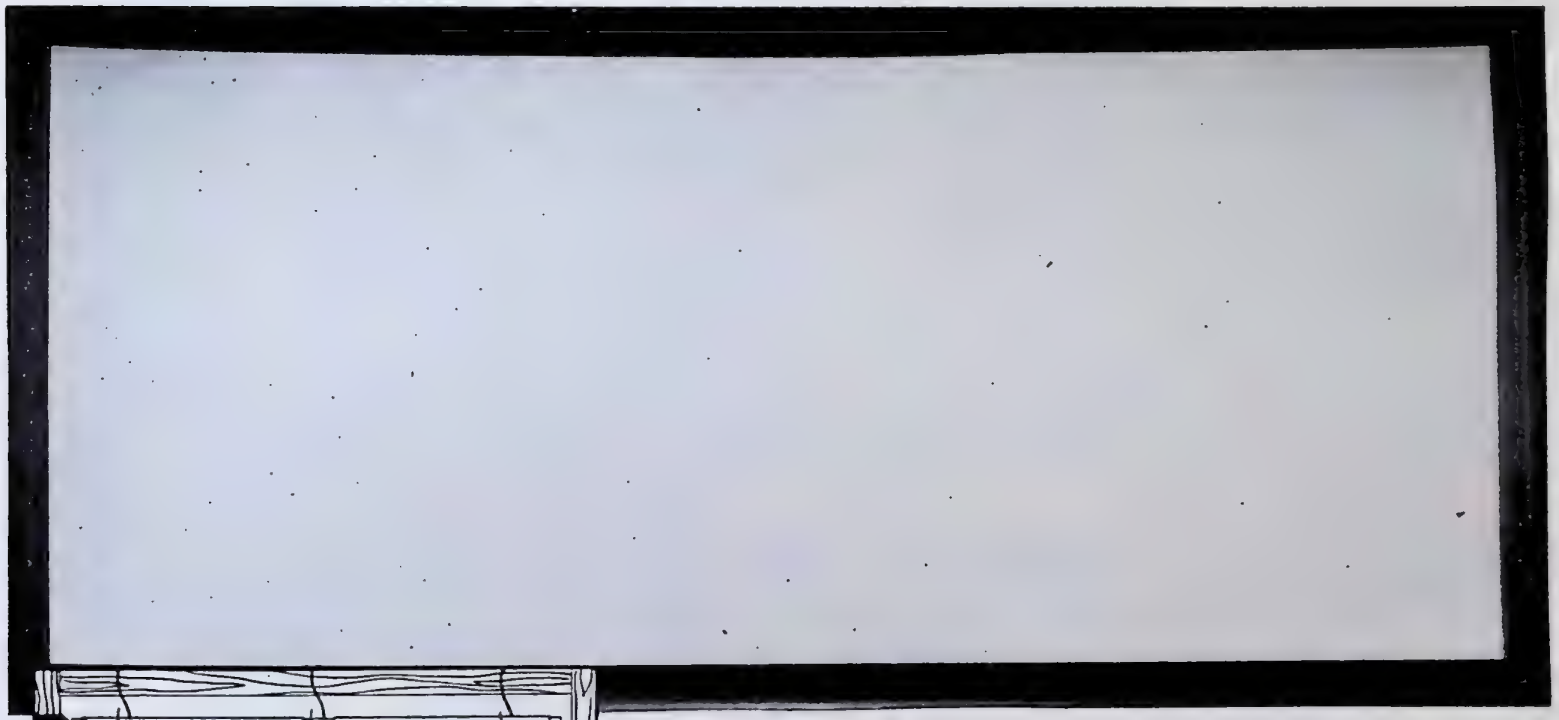
J·E·ROBIN, INC. ★ MARK OF QUALITY ★

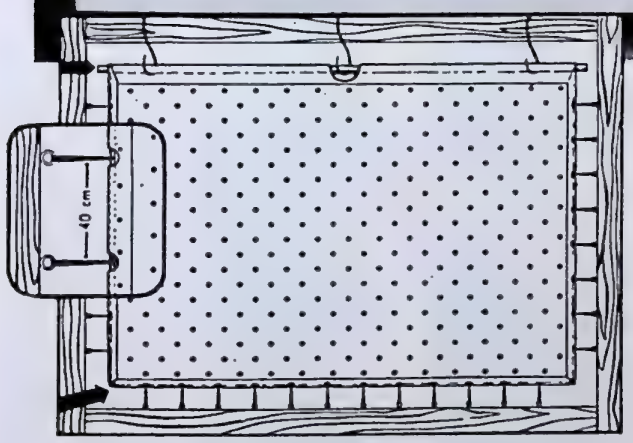
* . . . . *Best by Test!*

The "ALL-BRITE" *ALL PURPOSE* SCREEN for

CINEMASCOPE • VISTAVISION • WIDESCREEN

*** We Have the Proof . . . Be Sure to See It!**





Manufactured by
MAX SCHUMANN
Hamburg 36, Germany

The Screen of Unexcelled . . . Unrivaled Efficiency

- Especially designed for use of all projection services, including the panoramic, the All-Brite is made in all required sizes without limitation.
- Made of untearable, homogeneous Vinyl free from textiles, the All-Brite is not sewn but invisibly welded . . . does not show seams even under the brightest light.
- The All-Brite is dust resistant, does not attract humidity, neither rots nor molds and is termite-proof. It will function ideally even in the tropics and insures a natural reproduction of all color films.

Due to a unique method of suspension, the All-Brite screen functions as and resembles a single, undivided piece in even the largest surfaces. Tension tubes which can be readily taken apart for transportation assure a perfect tightness. There is no buckling or sagging. Patent rights in Europe and overseas.

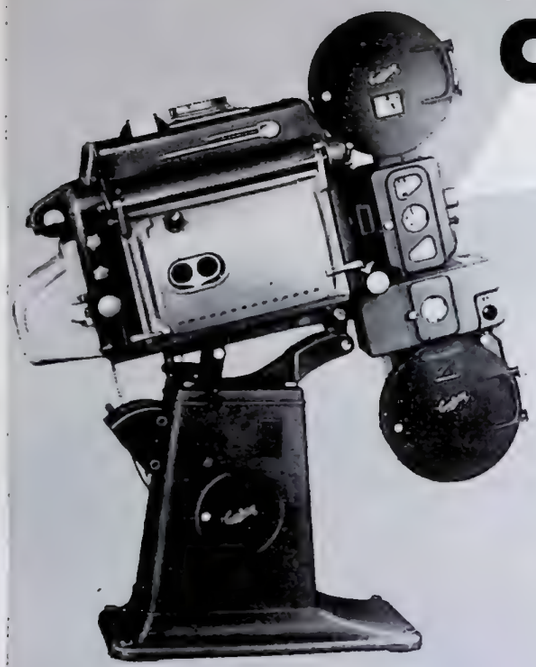
Write or Wire for Complete Information and Literature.

267 RHODE ISLAND AVENUE, EAST ORANGE, NEW JERSEY

CABLE ADDRESS: JEROBIN, U.S.A.

Century

Pick a feature-any feature
CENTURY HAS IT



CENTURY has more *desirable* features than any other equipment. You will find no "gadget improvements" on CENTURY equipment — everything is scientifically arrived at — to give you *full dimensional* reproduction of picture and sound, with trouble-free operation.

HIGH EFFICIENCY MECHANISMS. CENTURY projectors require almost no maintenance. They contain fewer parts (10 gears where others require up to 23) in simple arrangement so that stress and wear are at a minimum. Fewer gears and shafts mean less trouble, lower maintenance, less vibration, sharper pictures . . . finer projection.

CLEAN, TROUBLE-FREE OPERATION. CENTURY has reduced lubrication headaches. There are no oil sprays or oil baths to mess up film and projection room. Oil-less bearings and glass-hard steel gears rule out bindups.

MAXIMUM LIGHT PROJECTION. CENTURY design fully utilizes the advantage gained from the use of highpower arc lamps and high speed lenses.

WATER-COOLED PROJECTOR APERTURE. An exclusive CENTURY development which is optional equipment on all CENTURY projectors. It increases screen illumination and reduces film distortion and focusing trouble.

CENTURY 3-D EQUIPMENT. CENTURY 3-D electrical or mechanical interlocks may be used on any type projector. Accessories include high quality polarizing filters and viewing glasses.

Century

ENGINEERED SOUND SYSTEMS - STANDARD - STEREOPHONIC - PERSPECTA are designed to meet your needs—present and future. They give you the best that modern science can offer.

UNIT PRINCIPLE DESIGN. Each CENTURY installation can be selected to meet the physical or financial requirements of any theatre or drive-in.

AWARD-WINNING SOUND QUALITY. CENTURY sound reproducers feature the famous *hydro-flutter suppressor,* exclusively — winner of an Academy Award because it is a "fundamental improvement in film drive" and "results in improved quality in the theatre". (Citation of the Academy of Motion Picture Arts and Sciences). CENTURY sound has unusually high fidelity due to the low flutter obtainable with CENTURY sound reproducers.

SIMPLIFIED OPTICAL SYSTEM. CENTURY sound reproducers employ a high-efficiency straight-through optical system. No mirrors or prisms to fog or tarnish. Amplification requirements and noise interference are reduced.

MECHANICAL ADVANTAGES. Quick threading; oil-less bearings; interchangeable unit construction, simplified service; standarized design for use with any standard make of projector or pedestal.

CENTURY STEREOPHONIC SOUND—another brilliant new design achievement by CENTURY. The whole system except for penthouse reproducers and stage speakers is contained within one medium sized permanently wired enclosure. It is simple to install, operate and service. This system possesses wide flexibility for any magnetic sound presentation and contains ample facilties for conversion to future needs. Single or multiple-track reproduction.

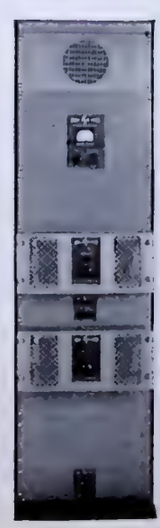
CENTURY PERSPECTA SOUND. The latest developments in Perspecta sound integrators and systems for installation with conventional optical sound equipment or with multiple-track sterophonic sound installations.



CENTURY W5 Amplification System with D.C. Exciter Supply



Stereophonic 3 or 4 channel amplification unit



CENTURY W5 Amplification System — 200 — 400 watts (Duo power Amplifiers Rack Mounted)

See your CENTURY dealer or write:

CENTURY PROJECTOR CORPORATION
NEW YORK, N. Y.

Century



Now stereophonic sound

packaged for any size theatre



For the Medium Size Theatre — Series 2000

Designed so that the smaller theatre can have top quality stereophonic sound at a budget price. Wall mounted units save space in small booths. Complete package includes magnetic soundheads, pre-amplifiers, power amplifiers, stage speakers and booth monitor.

Larger Size Theatre — Series 3000

Compact plug in type equipment that delivers ample power for the theatre in the less than 1200 seat bracket. Package includes all necessary equipment, magnetic soundheads, pre-amplifiers, power amplifiers, booth monitor and stage speakers.

Flagship Theatre — Series 6000

Plenty of power! You get the finest sound delivered to every cornor of your theatre. Like all Ballantyne stereophonic sound, you'll have to listen to it to believe it, because here is the way stereophonic sound should be.

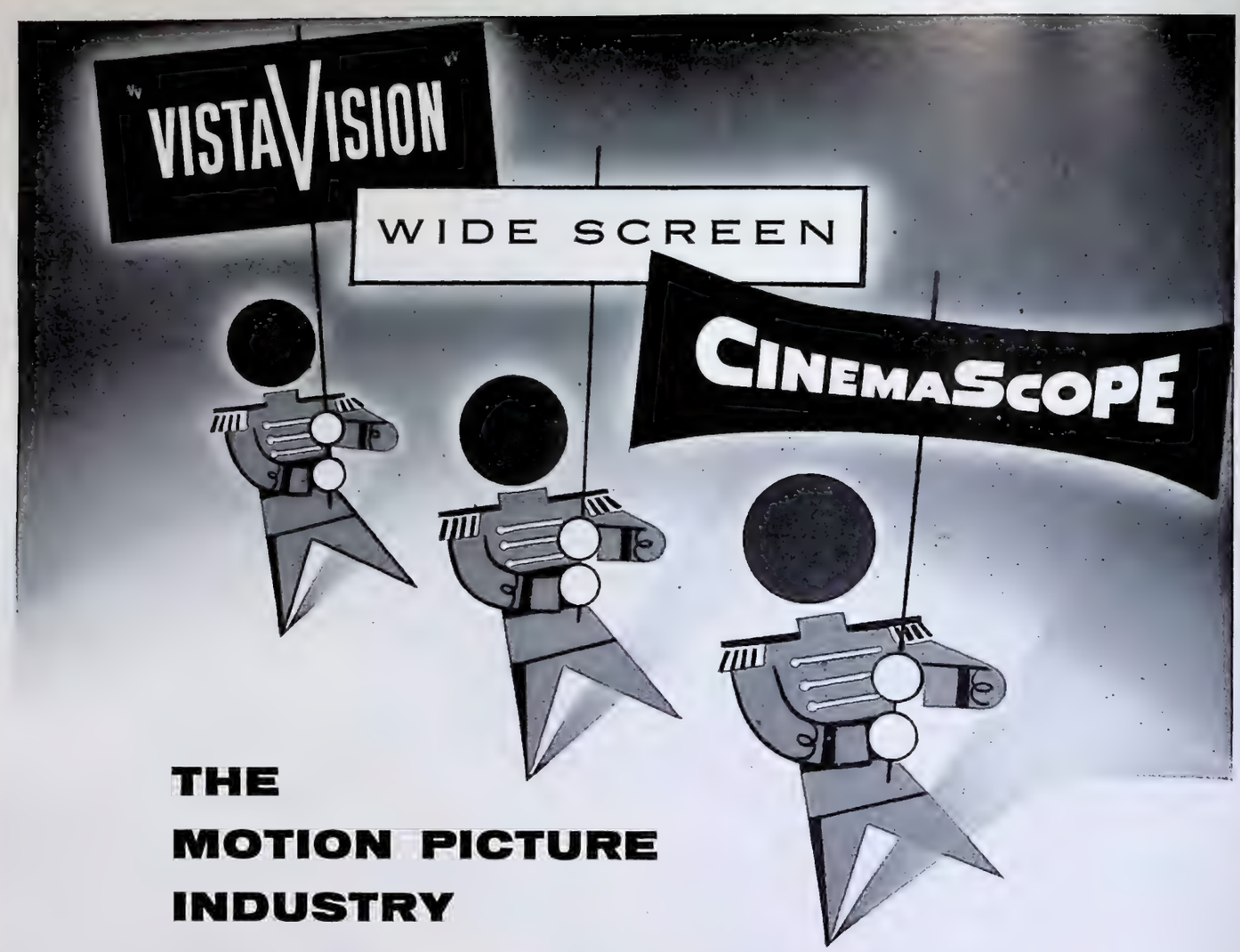
Drive-In Theatre — Series 4452

Supplied with magnetic soundheads, compact, wall mounted pre-amplifiers, and power supply. Easy to install and service.

Let us Help you — To get the most out of stereophonic sound requires careful skilled engineering. Ballantyne engineers give you personalized, face-to-face attention and service to find out what is best for your theatre. That's why when you buy Ballantyne, you know it's right.

The Ballantyne Company

1712 Jackson St. **Omaha, Nebraska**



THE MOTION PICTURE INDUSTRY IS ON THE MARCH!

Not so long ago the words "CINEMASCOPE," "WIDE SCREEN," "VISTAVISION" AND "STEREOPHONIC SOUND" were strange words, indeed! Today, every exhibitor is fully aware of their meaning and importance to the industry.

With the arrival of each new technique come fresh new problems, new equipment and the need for good clear thinking. National Theatre Supply has always been ready with the newest and finest equipment and reliable, up-to-the-split-second thinking which have made it possible for exhibitors throughout the country to put on the best show for their patrons.

National Theatre Supply is always at your service to help with any equipment or supply problem, no matter how difficult. To keep your best foot forward . . keep in touch with the National man from one of the 29 branches coast to coast . . . he'll be glad to help you!

NATIONAL
THEATRE SUPPLY
Division of National • Simplex • Bludworth, Inc

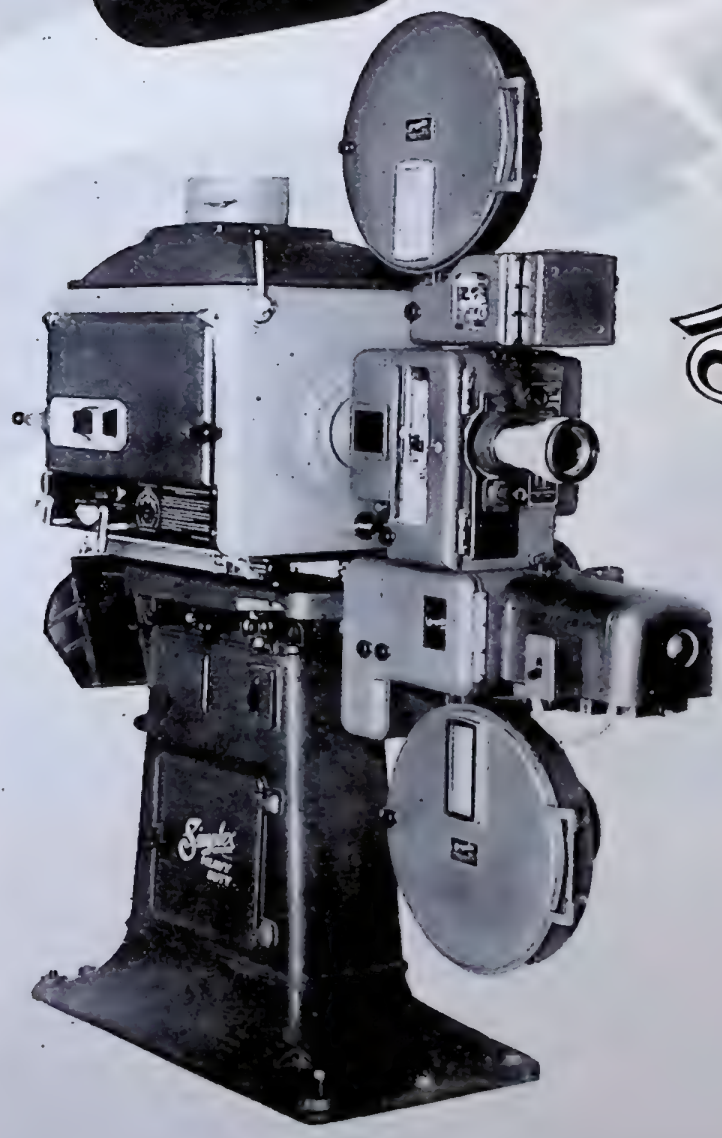
92 GOLD STREET, NEW YORK 38, and 29 BRANCHES COAST TO COAST

NATIONAL THEATRE SUPPLY EXPORT • 92 GOLD ST., NEW YORK 38, U.S.A. • CABLE ADDRESS: NATHESUPLY, N. Y.

PROJECTION and

SOUND!

By



Simplex

T. M. REG. U. S. PAT. OFF.

LOOK—SEE—HEAR—and be convinced by Simplex Superior Performance. For built into Simplex equipment you find the mechanical and electronic genius that produces the clearest picture and truest sound obtainable today.

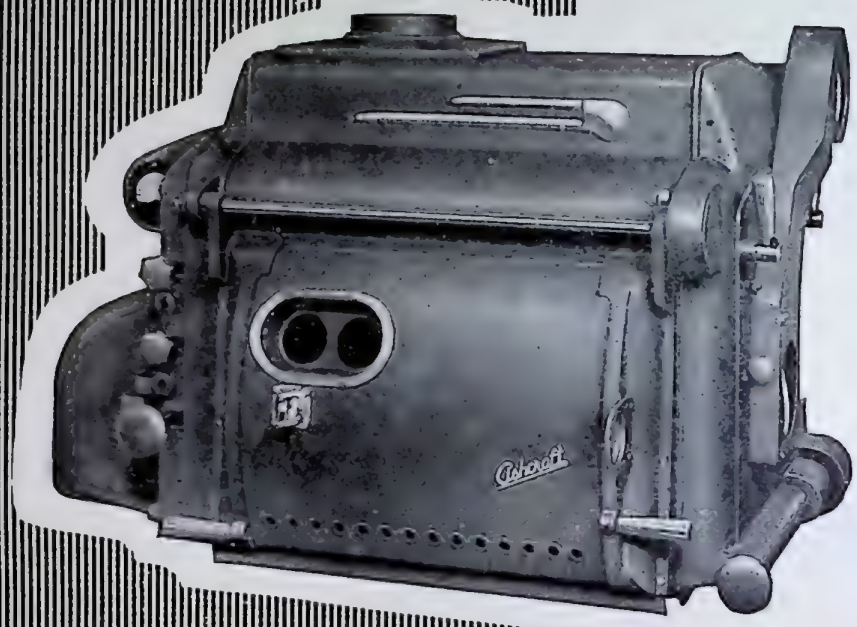
Every projection aspect ratio — every sound reproduction system — is yours with Simplex. And in both, projection and sound, there is always the quality of perfection . . . unmatched. When you buy—buy Simplex, you'll find the price well within your means.

MANUFACTURED BY INTERNATIONAL PROJECTOR CORPORATION • DISTRIBUTED BY NATIONAL THEATRE SUPPLY

SUBSIDIARIES OF GENERAL PRECISION EQUIPMENT CORPORATION

ASHCRAFT

SUPER POWER



NOW OPERATING IN THE LARGEST THEATRES USING

GIANT SCREENS

70-128 FEET WIDE*

Recent tests have definitely proved that the Ashcraft Super-Power at currents of 95 to 105 amperes produces far more light and of a better quality than other lamps using from 135 to 180 amperes—(the complete Super-Power range is 85 to 135 amperes).

There is no film buckle with the Super-Power—equipped with the Ashcraft Air-Cooled Heat Deflector.

The Super-Power is especially engineered and constructed to meet the present-day requirements of the largest and widest screens or for large screen 3-D—whether for Indoor or Drive-In projection.

The Super-Power is in daily operation in indoor theatres projecting 70 ft. pictures.

Drive-In theatres, with 128 ft. screens, are in year around operation using the Super-Power.

ASHCRAFT HYDRO-ARC© 75-85 AMPS



PRODUCES MORE LIGHT THAN NEEDED FOR 30-45 FOOT WIDE SCREENS USED IN SMALLER THEATRES

The Ashcraft Hydro-Arc is of the same high quality and efficiency as the Super-Power, yet is specifically designed for those theatres not adaptable to enormously large screens.

The Hydro-Arc supplants and is far more powerful than the outmoded Suprex type lamp which used short copper coated carbons. Suprex is not adaptable to present-day wide screen projection standards yet costs more to operate than the powerful Hydro-Arc.

The Ashcraft Hydro-Arc uses 9 m/m x 20" uncoated High-Intensity Carbons (which do not require rotation due to double magnetic arc stabilization). The long 20" carbon costs substantially the same as the Suprex 14" copper-coated carbon yet burns more than twice as long.

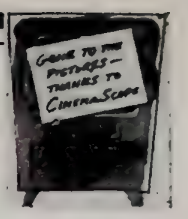
A genuine Bausch & Lomb High-Speed Reflector assures maximum light efficiency.

The first cost and operating expense of the Hydro-Arc is low and well within the reach of exhibitors who demand high-powered, economical projection.

Hydro-Arcs are ideal for large screen 3-D (long burning over one hour) or for Drive-In theatre screens up to 50 ft. wide.

Distributed U.S.A.: Through Independent Theatre Supply Dealers • Foreign: Westrex Corp. • Canada: Dominion Sound Equipments, Ltd

C. S. ASHCRAFT MANUFACTURING COMPANY, INC.
36-32 THIRTY-EIGHTH STREET • LONG ISLAND CITY 1, N. Y.



For

CINEMASCOPE

Peerless HY-CANDESCENT TRADE MARK REG CINEARC

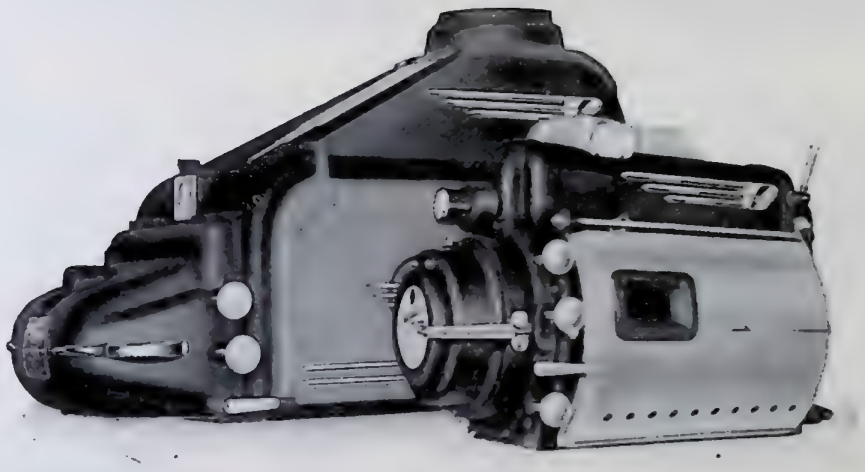
(NOT A REFLECTOR ARC)

32,000 TOTAL LUMENS

At 180-185 Amperes . . . With No. 15363-Q and No. 15367-P, "Hy-Speed" Condensers . . . With a .715" x .912" "CinemaScope" aperture . . . With a 3" Focus, F-1.8 coated projection lens . . . On any kind or any size of screen . . .

Using presently available and **standard** carbons, there is "No other projection lamp in the world, today" that can produce so much light.

TRUTH IN ADVERTISING



Peerless MAGNARC TRADE MARK REG CINEARC

22,000 TOTAL LUMENS

At 75-77 Amperes . . . With presently available and standard 8 x 9 m/m copper coated carbons . . . With a .715" x .912" "CinemaScope" aperture . . . With a 3" Focus, F-1.8 coated projection lens . . . With a 14" diameter No. 2012 PEERLESS "Hy-Lumen" glass reflector that retails at a list price of $22.00 F.O.B. Chicago . . . With a No. 2880 PEERLESS Tail Flame Flue . . . On any kind or any size screen . . . No Heat Filter required.

All of this, at the **lowest** possible first, and operational cost. And with . . .

NO-HIGH-RATE *OF ($60.00) REFLECTOR BREAKAGE OR SILVERING DETERIORATION—* !

COMPLETE DATA FOR THE ASKING

A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

J.E. McAULEY MFG. CO.

552-554 WEST ADAMS STREET
CHICAGO 6, ILLINOIS

THE PROJECTION ARC LAMP THAT IS READILY ADAPTABLE TO ALL TYPES OF MODERN SCREEN PRESENTATION

NATIONAL EXCELITE "135"



■ The Automatic Crater Positioning Central System insures that both carbons are so fed as to maintain a correct arc gap length and to keep the position of the positive crater at the exact focal point of the reflector. Thus, throughout the presentation, the screen light is always of the same color, without variations from white to either blue or brown. The projectionist is accordingly freed from the necessity of constantly supervising the arc so that he can devote himself to the care of other technical features of projection which require continual attention.

■ National's Reflect-O-Heat unit permits the great increase in volume of light at the mammoth new screens, without a corresponding increase in heat at the aperture.

■ The arc is stabilized by a stream of air which maintains a prescribed system of ventilation of the area surrounding the arc. This air jet prevents the hot tail flame of the arc from reaching the reflector, supplies enough oxygen so that no black soot is produced, and keeps white soot from collecting on the reflector in such quantity as to absorb heat which would cause breakage.

Unit construction permits easy removal of the elements for inspection in servicing.

An Efficient, Dependable Power Supply for Your Projection Arcs

NATIONAL RECTIFIERS

■ There's a National Tube or Selenium Plate Type Rectifier designed to match the requirements of every type and rating of angle trim or coaxial trim projection arc lamp. All are built in single lamp units for flexibility of electrical connection.

■ Power output adjustment to the arc, over a wide range of values while the arc is burning, is by means of an external, manually operated hand wheel on the front. Transformer taps are provided to compensate for changes in line voltages from 200 to 250 volts and the complete amperage range.

NATIONAL REFLECTORS

■ The brilliancy of your projected pictures, regardless of the efficiency of all other equipment, is dependent directly upon the condition of your lamphouse reflector. The only light which can reach your screen must necessarily be reflected to it by this mirror.

■ All reflectors gradually deteriorate to a state where replacement cost becomes insignificant, since a drop of only 10% in their reflective efficiency results in a corresponding decrease in screen brilliancy, and accordingly also represents a loss amounting to 10% of the cost of your current and carbons.

Available for replacement in all types and makes of arc lamps.

Distributed by

NATIONAL THEATRE SUPPLY

Division of National-Simplex-Blodgett Co.

"There's A Branch Near You"

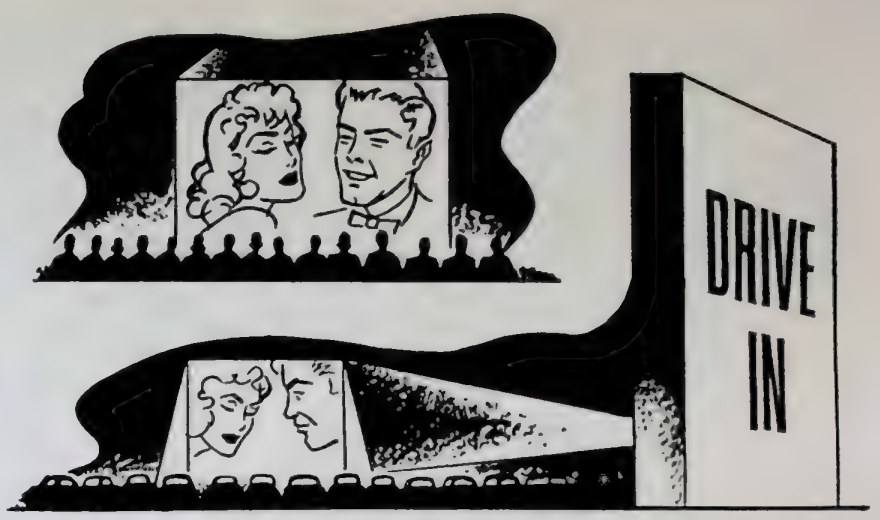
NO MATTER THE

POWER

REQUIREMENTS

HERTNER

HAS A



TransVerteR®

.. to fit EVERY THEATRE NEED

NEW HT135 TransVerter
(90 volts) for 115 to 135 ampere arcs to accommodate all types of wide screen projection.



Regardless of whether your demands for DC arc current for projection are small or large, there is a TransVerter particularly well-suited for your installation. The latest methods of manufacture, and new design features in Hertner TransVerters give users a source of DC power that is remarkable for its extreme steadiness, responsiveness, quietness and freedom from excessive maintenance. Write today, so that we may send you the interesting details of the TransVerter that will do the job for you—dependably and economically.

Mention Bulletin No. 301B

Distributed by National Theatre Supply.
In Canada: General Theatre Supply Company

THE HERTNER ELECTRIC COMPANY
12690 ELMWOOD AVE. • CLEVELAND 11, OHIO

MOTORS • MOTOR GENERATORS • GENERATOR SETS



A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION



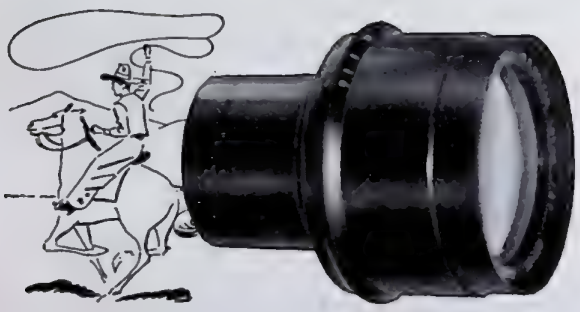
for Top Boxoffice Gross!

Every thrilling detail **on film** with

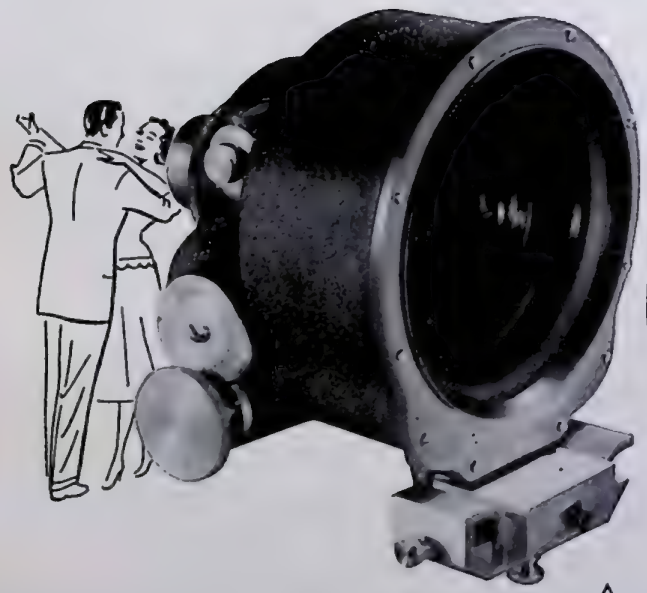
Bausch & Lomb

BALTAR

Cinematography Lenses



BALTAR LENSES
for 2D and 3D movies



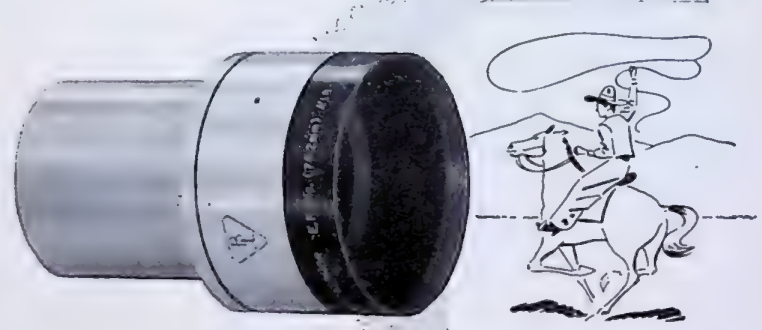
BALTAR LENSES
for CinemaScope

Every thrilling detail **on your screen** with

Bausch & Lomb

f/1.8 SUPER CINEPHOR

Projection Lenses



SUPER CINEPHOR LENSES
. . . for normal 2D-3D movies
. . . for expanded 2D-3D movies

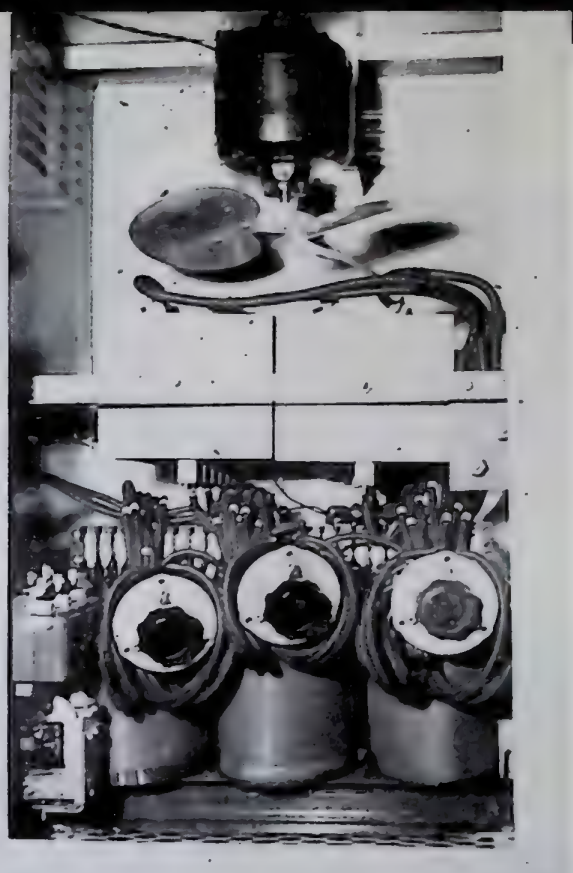


SUPER CINEPHOR LENS
with Anamorphic Adapter
for CinemaScope

BAUSCH & LOMB
SINCE B&L 1853

WRITE for complete information on B&L motion picture lenses. Bausch & Lomb Optical Co., 76154 St. Paul St., Rochester 2, New York

"SELECTIFIERS" SELECT-A-VOLTAGE SELENIUM RECTIFIERS



TODAY'S RECTIFIERS for TOMORROW'S ARCS

"50,000 HOUR" and "SUPERIOR" SELECTIFIERS are simple in installation, operation and maintenance, soundly engineered to meet abrupt changes in load, accidental overloads, corrosive atmosphere, room high-temperature conditions and—to deliver full rated output continuously at high efficiency.

Both "50,000 HOUR" and "SUPERIOR" models have:

— Uninterrupted, efficient performance under the severe demands of today's new projection techniques.

— Variable high and low range voltage control.

— Automatic protection against overloads and stack overheating.

— Scientifically designed down-draft ventilation.

— Rugged transformers which deliver their full rated output continuously, from glass-insulated windings.

— Simple dial controls allow any required adjustment with a flick of the wrist.



In both the "50,000 HOUR" and "SUPERIOR" models, Selenium Stacks are custom built and assembled by hand from pre-tested selenium plates which guarantees a match of the resistance characteristics of the plates in each stack. Result: Stack runs cooler, stands greater overloads, no "weak spot" where failure can start.

Multiple coats of special corrosion resistant enamel and final spraying of moisture proof and fungus proof varnish assures corrosion-proof performance.

SELECTIFIERS are designed for double-load use in emergencies.

Only SELECTIFIERS "50,000 HOUR" model has thermostatically controlled alarm signal.

SELECTIFIERS are available for immediate delivery in various ranges from 50 to 250 Amps to suit any type of arc. Special models to 450 Amps.

IMMEDIATE DELIVERY

Write or Wire for Complete Details

Distribution open in some states and countries

DESIGNED AND MANUFACTURED BY: AMERICAN **SELECTIFIER** DIVISION

DISTRIBUTED BY **NORPAT, INC.** 113 W. 42 ST., N. Y. 36, N. Y.

DISTRIBUTORS OF EVERYTHING FOR THEATRES EXCEPT FILMS — TELEPHONE: BRYANT 9-5055

EXPORT: NORPAT INT'L DIV. — CABLES NORPACREST, NEW YORK

NEW YORK OFFICE FOR: INTERNATIONAL SEAT CORPORATION

ANNOUNCING TWO GREAT NEW LENSES



the SUPER SNAPLITE F/1.7

and SUPER SNAPLITE F/1.7X

Now Finer Lenses for Finer Motion Pictures with a True Speed of f/1.7 in all sizes where fast lenses are needed.

From Kollmorgen...the newest, fastest projection lenses you can buy. To give you the brightest, clearest, sharpest, most uniform picture you have ever seen on your screen. For better Boxoffice, better patron satisfaction, better all around filming, try the new SUPER SNAPLITE f/1.7 today. When vignetting is a problem investigate the SUPER SNAPLITE f/1.7X.

True speed of f/1.7 in focal lengths from 2 inches through 4 inches in ¼ inch steps. Ask your Theatre Supply Dealer about these fine lenses. For more information ask your dealer or write for Bulletin 222.

K C®

KOLLMORGEN *Optical* CORPORATION

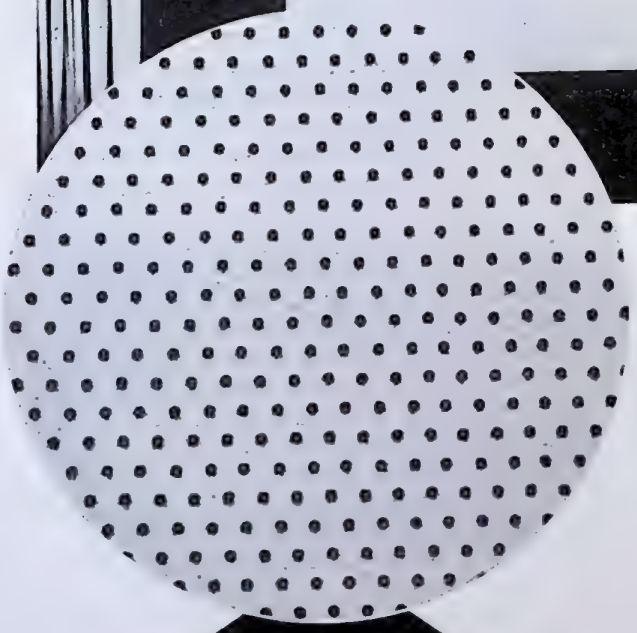
Plant: 347 King Street, Northampton, Massachusetts **New York Office: 30 Church Street, New York 7, N. Y.**

The Screen with a Future — and a Present too!

WILLIAMS ALL-PURPOSE SILVER SCREENS



The photo above shows a Williams All-Purpose Silver Screen in the Palace Theatre of Akron, Ohio. The fifty-foot screen was installed over a year ago and today it still supplies sharp definition in every projection method.



ACTUAL PHOTO

The doughnut-shaped indentation, scientifically measured and exactly surrounding every perforation, plus the clean, even silver finish of Williams screens, supplies clear, sharp pictures and uniform distribution of light for all viewing angles.

for

CINEMASCOPE • VISTAVISION
WIDE SCREEN • 2-D AND 3-D

No seams to mar the picture since the entire screen is welded into one piece.

Solid-plastic construction makes the screen extremely tough, tear-proof and flexible.

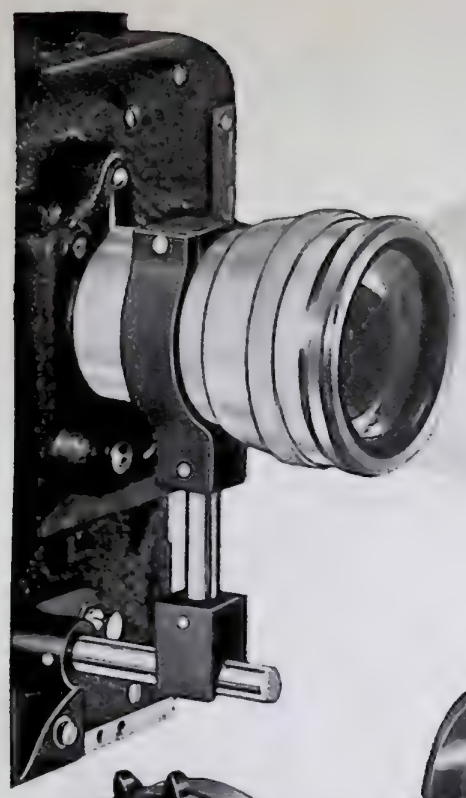
The exclusive infra-red baking process insures screens of long life and durability.

USED BY LEADING CIRCUITS EVERYWHERE, WITH OVER ONE HUNDRED SUPPLIED FOR THE STANLEY WARNER CHAIN.

WILLIAMS SCREEN CO.

Originators of all-plastic vinyl screens

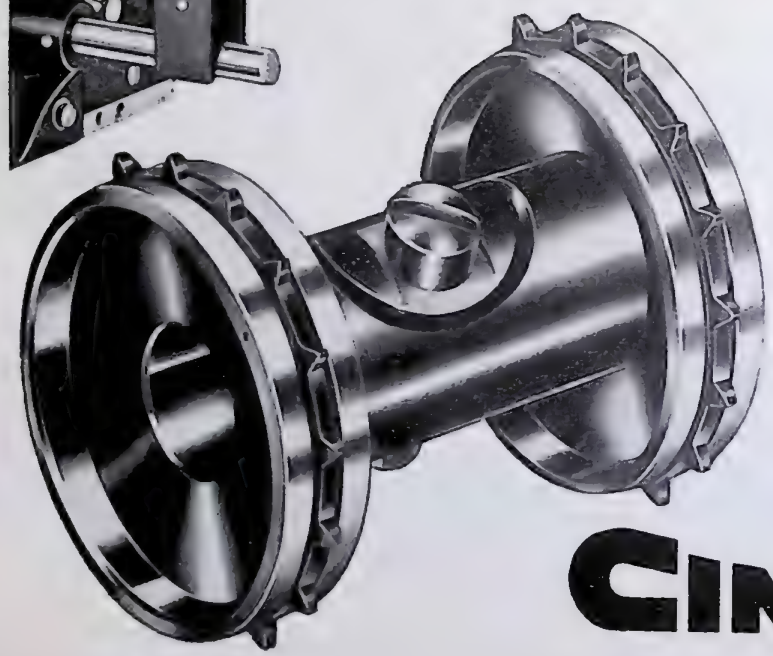
1674 SUMMIT LAKE BOULEVARD
AKRON 7, OHIO



CONVERSION KITS *For* CINEMASCOPE



SUPER LaVezzi SERVICE
REG. U.S. PAT. OFF.



LaVezzi SPROCKETS *For* CINEMASCOPE

The new wide screen presentations demand rock steady projection which for years exhibitors have been expecting–and getting–by using LaVezzi sprockets. In addition, the clean burr-free teeth are easier on the film—an important factor with the narrow perforations of the four stripe magnetic film. LaVezzi sprockets are properly engineered to resist wear—and are hardened for that extra margin of usable life. For better projection and peace of mind get LaVezzi and be sure!



LAVEZZI MACHINE WORKS

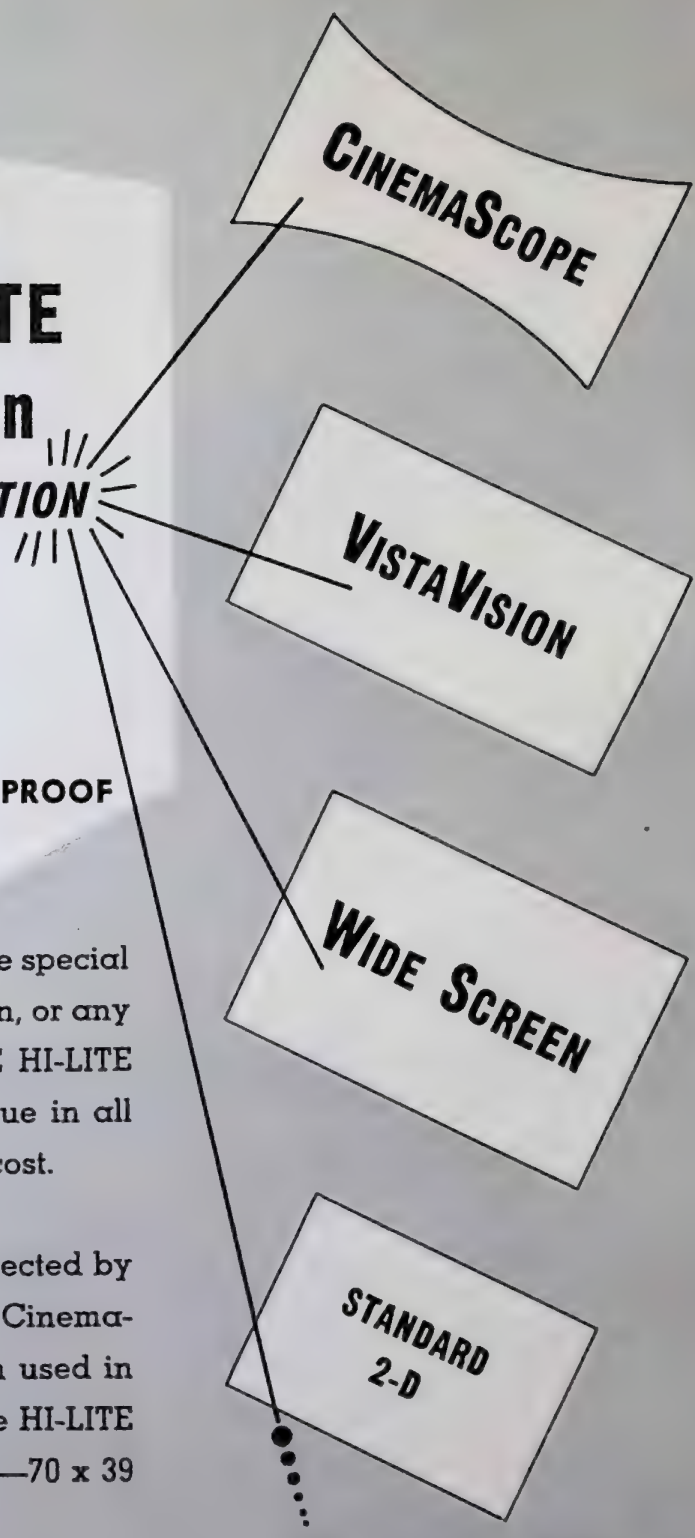
4635 WEST LAKE ST. • CHICAGO 44, ILL.

YOUR SCREEN WORRIES ARE OVER...
...IT'S HERE!

Vocalite's *NEW*
ULTRA WHITE HI-LITE
All Purpose Screen

BETTER FOR ANY TYPE PROJECTION

- NO VISIBLE SEAM LINES
- PERFECT LIGHT DISTRIBUTION
- CLARITY & BRIGHTNESS
- 100% VINYL PLASTIC
- TEAR PROOF & FUNGUS PROOF
- EASILY CLEANED



NOW . . . You do not need to buy an expensive special surfaced screen for CinemaScope, VistaVision, or any Wide Screen projection. The ULTRA WHITE HI-LITE SCREEN gives finer definition and color value in all Wide Screen processes and—at MINIMUM cost.

The ULTRA WHITE HI-LITE SCREEN was selected by Radio City Music Hall for all films shown in CinemaScope and Wide Screen and was the screen used in the important VistaVision demonstration. The HI-LITE SCREEN at Radio City is the world's largest—70 x 39 feet.

AND . . . for the Exhibitor who wishes to play 3-D pictures inquire about our SILVER-LITE 3-D Screen.

BEFORE YOU BUY—BE SURE TO INVESTIGATE

See your local Theatre Supply Dealer or write

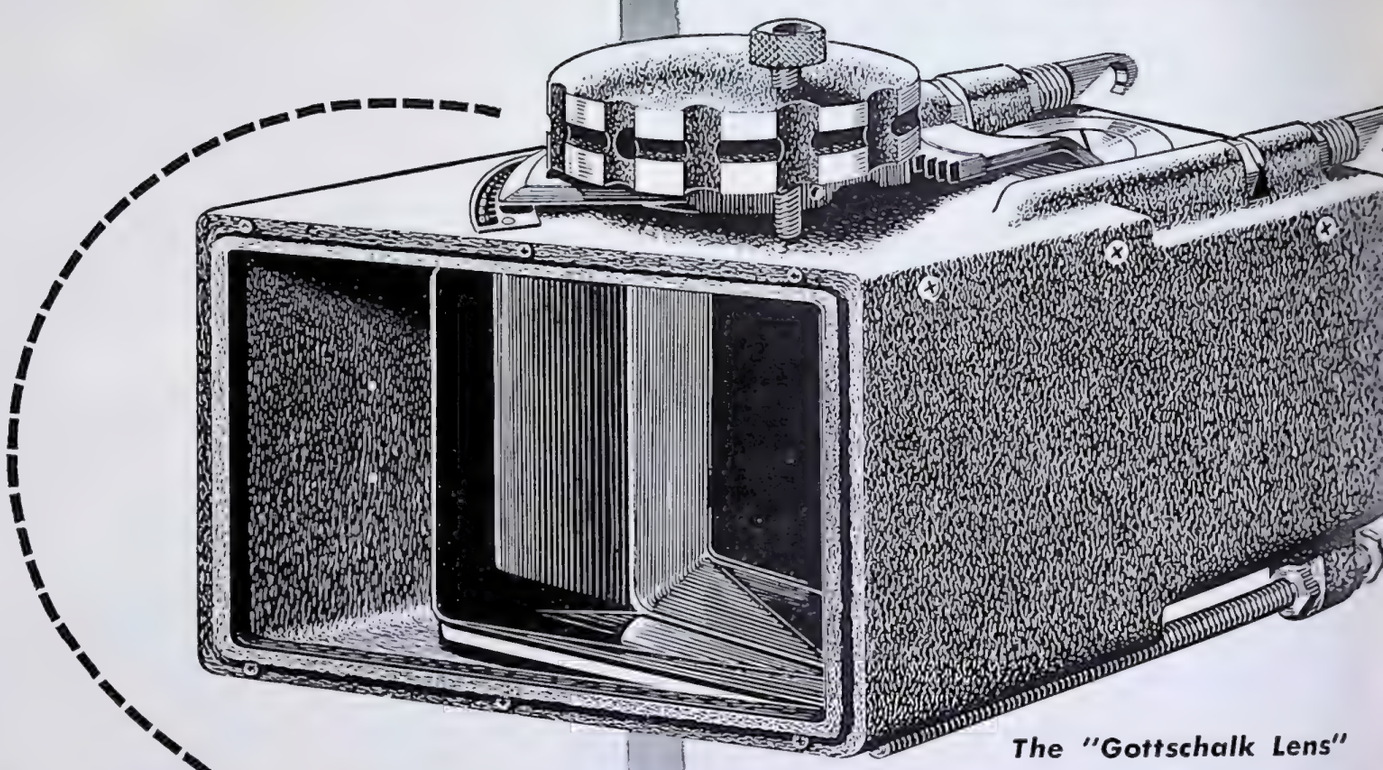
VOCALITE SCREEN CORPORATION

ROOSEVELT, NEW YORK, U. S. A. **Cable Address: VOCALITE, FREEPORT, N. Y.**

Manuacturers of Fine Motion Picture Screens Since 1927

For clearest, brightest pictures from edge to edge...

with no distortion!



The "Gottschalk Lens"

When projecting on the larger screen areas of the new wider screens it is vital to have maximum light efficiency. Comparative tests have demonstrated that with Super Panatar Variable Aspect Lens you get:

1. **Greater light transmissions**
2. **Highest, sharpest definition**
3. **The finest color rendition**
4. **Elimination of distortion due to curved screens**

These are a *few* of the reasons why there are more Super Panatars installed than any other variable anamorphic lens.

SUPER PANATAR "100" . . . . *only* **$895.00** per pair

Also available for use with 4" dia. f 1.8 objective lens for both outdoor and indoor installations.

Any aspect ratio at the twist of a single knob...

The Super Panatar can be converted to any aspect ratio from standard to Vista Vision to Cinemascope by a twist of a single knob. This easy instant switching affords wonderful opportunities for new exciting screen showmanship. Super Panatar has been approved for use with all existing systems—and will take care of any new systems that may be developed in the future.

SUPER PANATAR

MANUFACTURED BY PANAVISION, INC.

Exclusive Distributors

RADIANT MANUFACTURING CORP. - 1209 S. Talman Ave., Chicago 8, Ill.

Phone: CRawford 7-6300 Cable Address: RADMAFCO

From Exhibitors Everywhere

comes the STAMP of APPROVAL for

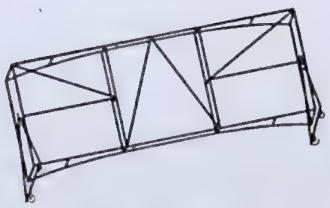
RAYTONE PRODUCTS





RAYTONE HILUX SCREENS

Raytone HILUX Screens meet the most exacting requirements of every projection system... CinemaScope and all wide-screen systems, 3-D, color or black and white. They are seamless in construction, have perfect uniformity of surface and are unconditionally guaranteed to live up to all claims or the exhibitor pays *nothing!*



RAYTONE-THOMPSON SCREEN FRAMES

Still the greatest of them all. Lighter, sturdier, easier to erect, adjustable, movable.

RAYTONE SCREEN PAINT



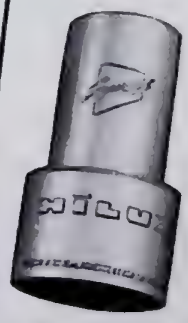
The outdoor theatre screen paint that sticks to the job! The job of providing maximum reflection at minimum expense. Get astounding results with amazing ease. A single coat can do the job you didn't know was possible . . . a second coat positively guarantees it!

RAYTONE SCREEN BRUSHES

Made of rare, hard-to-get bristles, this unique brush is especially designed to rid your screen of dulling dust and dirt. Simple to use, it's a low-cost investment in high-quality reflectance. For new screens.

HILUX LENSES

Made by Projection Optics Co. Rochester, N. Y



Hilux Objective Lenses fill your screen with a brighter, clearer picture. Designed as a primary lens for every wide-screen system used today . . . a *true* anastigmat lens. They're absolutely your best buy for maximum light transmission, razor-edge definition.

THE NEW HILUX VAL

is a Variable Anamorphic Lens of superior design. Instantly adjustable for any aspect ratio from 2.66 to 1 down to 1.33 to 1. Sharp definition. Maximum light transmission. The ideal lens for CinemaScope because of its extreme flexibility. **$750.** per pair.

RAYTONE SCREEN CORP.

165 CLERMONT AVENUE
BROOKLYN 5, NEW YORK

MIDWEST REPRESENTATIVE: L. E. COOLEY, 408 SOUTH OAK PARK AVENUE, OAK PARK, ILLINOIS

WHY THE WALKER *High Intensity* SCREEN IS THE *MOST WANTED* SCREEN TODAY!

1 SEAMLESS

The High-Intensity Screen is a *seamless screen,* molded in one continuous piece over a reinforced cloth backing!

2 DOES NOT DISCOLOR

The surface of the High-Intensity Screen *does not* lose its reflectivity or change color. The materials used in the surface do not discolor or darken in themselves.

3 FULLY GUARANTEED

The High-Intensity Screen is guaranteed against anything which renders it unsatisfactory for use except actual physical damage. This guarantee extends for a period of three years.

4 TIME TESTED . . . and PROVED!

On the market before 3-D and wide screen, the High-Intensity Screen has been performance proved with every projection technique.

5 CONTOURED SURFACE

This wavy, contoured surface not only provides a better distribution of light and sound, but also makes the surface easier to keep clean . . . no sharp sound holes to collect dirt and dust.

6 DESIGNED FOR PICTURE QUALITY

The High-Intensity Screen has the brightest surface possible without emphasizing objectionable hot spot and flicker, caused by too specular a screen surface.

7 LABORATORY CONTROLLED

The materials used in molding the one piece continuous projection surface of the High-Intensity Screen are rigidly controlled in the same factory where the screen is made.

MANUFACTURED BY WALKER AMERICAN CORPORATION
Distributed by

NATIONAL
THEATRE SUPPLY
Division of National • Simplex • Bludworth, Inc.

NATIONAL PROJECTOR CARBONS

TRADE-MARK

FOR EVERY TYPE OF PROJECTION LAMP

Sold through Authorized Distributors

SCREEN ILLUMINATION WITH CARBON-ARC MOTION PICTURE FILM PROJECTION SYSTEMS: BASED ON THE STANDARD 0.600 X 0.825-INCH APERTURE

CARBONS		Arc		Lamp optical sys.	80% dist.		Max. light[3]		Approx. carbon consump. rate, in./hr	
Positive Type	Negative Type	amp	volts		Screen lumens[1]	% dist.[2]	Screen lumens[1]	% dist.	Pos.	Neg.
Non-Rotating, Reflector-Type Lamps — "One Kilowatt" d-c Trim										
7-mm × 12 or 14 in. Suprex	6-mm × 9 in. Orotip C	40	27.5	11⅜ in. dia *f*/2.5 mirror	5,900	80	6,500	65	5.8	3.1
Non-Rotating High-Intensity Trims										
7-mm × 12 or 14 in. New Suprex	6-mm × 9 in. Orotip C	42	36	14 in. dia *f*/2.3 mirror	7,250	80	8,650	60	7.6	3.8
7-mm × 12 or 14 in. New Suprex	6-mm × 9 in. Orotip C	46	38	14 in. dia *f*/2.3 mirror	8,150	80	10,000	60	9.3	4.0
7-mm × 12 or 14 in. New Suprex	6-mm × 9 in. Orotip C	50	40	14 in. dia *f*/2.3 mirror	9,200	80	11,700	60	11.6	4.3
8-mm × 12 or 14 in. Suprex	7-mm × 9 in. Orotip C	60	36	14 in. dia *f*/2.3 mirror	10,300	80	11,000	65	9.0	3.8
8-mm × 12 or 14 in. Suprex	7-mm × 9 in. Orotip C	65	38	14 in. dia *f*/2.3 mirror	11,800	80	12,700	65	11.8	4.0
8-mm × 12 or 14 in. Suprex	7-mm × 9 in. Orotip C	70	40	14 in. dia *f*/2.3 mirror	13,000	80	14,000	65	15.0	4.3
9-mm × 14 in. Suprex	8-mm × 9 in. Orotip C	65	41	14 in. dia *f*/2.3 mirror	12,300	80	13,000	70	10.5	3.3
9-mm × 14 in. Suprex	8-mm × 9 in. Orotip C	75	45	14 in. dia *f*/2.3 mirror	13,800	80	15,000	70	15.5	3.8
Rotating, Reflector-Type Lamps										
9-mm × 20 in. High-Intensity	5/16 × 9 in. Orotip	75	52	16–16½ in. dia *f*/1.9 mirror	13,000	80	16,000	60	14.0	3.3
9-mm × 20 in. High-Intensity	5/16 × 9 in. Orotip	85	58	16–16½ in. dia *f*/1.9 mirror	15,000	80	19,500	55	22.0	3.5
10-mm × 20 in. High-Intensity	11/32 × 9 in. Orotip	100	60	16–16½ in. dia *f*/1.9 mirror	16,000	80	20,000	60	20.0	3.0
11-mm × 20 in. High-Intensity	⅜ × 9 in. Orotip	120	65	16–16½ in. dia *f*/1.9 mirror	(20,000)	80	(23,000)	65	20.0	2.7
10-mm × 20 in. Hitex	7/16 × 9 in. Orotip	125	64	16–16½ in. dia *f*/1.9 mirror			24,000	65	19.5	2.4
10-mm × 20 in. Hitex	7/16 × 9 in. Orotip	130	66	16–16½ in. dia *f*/1.9 mirror	(21,000)	80	25,500	65	25	2.6
10-mm × 20 in. Hitex	7/16 × 9 in. Orotip	135	70	16–16½ in. dia *f*/1.9 mirror			26,500	65	32	1.7
10-mm Ultrex[4] Experimental	Experimental	165	80	Exper. *f*/2.0 mirror			(34,000)	(60)	45	
11-mm Ultrex[4] Experimental	Experimental	195	80	Exper. *f*/2.0 mirror	(28,000)	80	(35,000)	(65)	45	
Rotating, Condenser-Type Lamps										
13.6-mm × 22 in. New High-Intensity	7/16 × 9 in. Orotip	125	68	Condenser lenses at *f*/2.0	11,500	80	14,500	60	7.25	2.4
13.6-mm × 22 in. New High-Intensity	½ × 9 in. Orotip	150	74	Condenser lenses at *f*/2.0	16,000	80	19,500	60	14.0	1.9
13.6-mm × 22 in. New High-Intensity	½ × 9 in. Orotip	160	77	Condenser lenses at *f*/2.0	(16,500)	80	20,500	60	17.5	2.1
13.6-mm × 22 in. Hitex Super	½ × 9 in. Orotip Heavy Duty	170	70	Condenser lenses at *f*/2.0	17,500	80	20,700	60	16.0	2.3
13.6-mm × 22 in. Hitex Super	½ × 9 in. Orotip Heavy Duty	180	74	Condenser lenses at *f*/2.0	19,300	80	24,800	60	21.5	2.5
13.6-mm × 22 in. Ultrex[4] Experimental	Experimental	265		Condenser lenses at *f*/2.0	(26,000)	80	(28,000)	(60)		
13.6-mm × 22 in. Ultrex[4] Experimental	Experimental	290	80	Condenser lenses at *f*/2.0	(30,000)	80	(34,000)	(60)	45	

NOTE: Values in parentheses are estimated or obtained from limited measurements.

[1] Screen lumen figure is for systems with no shutter, film or filters of any kind; measured with 5-in. E.F. *f*/2.0 and *f*/1.9 projection lenses.

[2] % distribution refers to ratio of light intensity at side of screen to that at the center.

[3] Maximum light is value with system adjusted to produce maximum light intensity at the center of the screen.

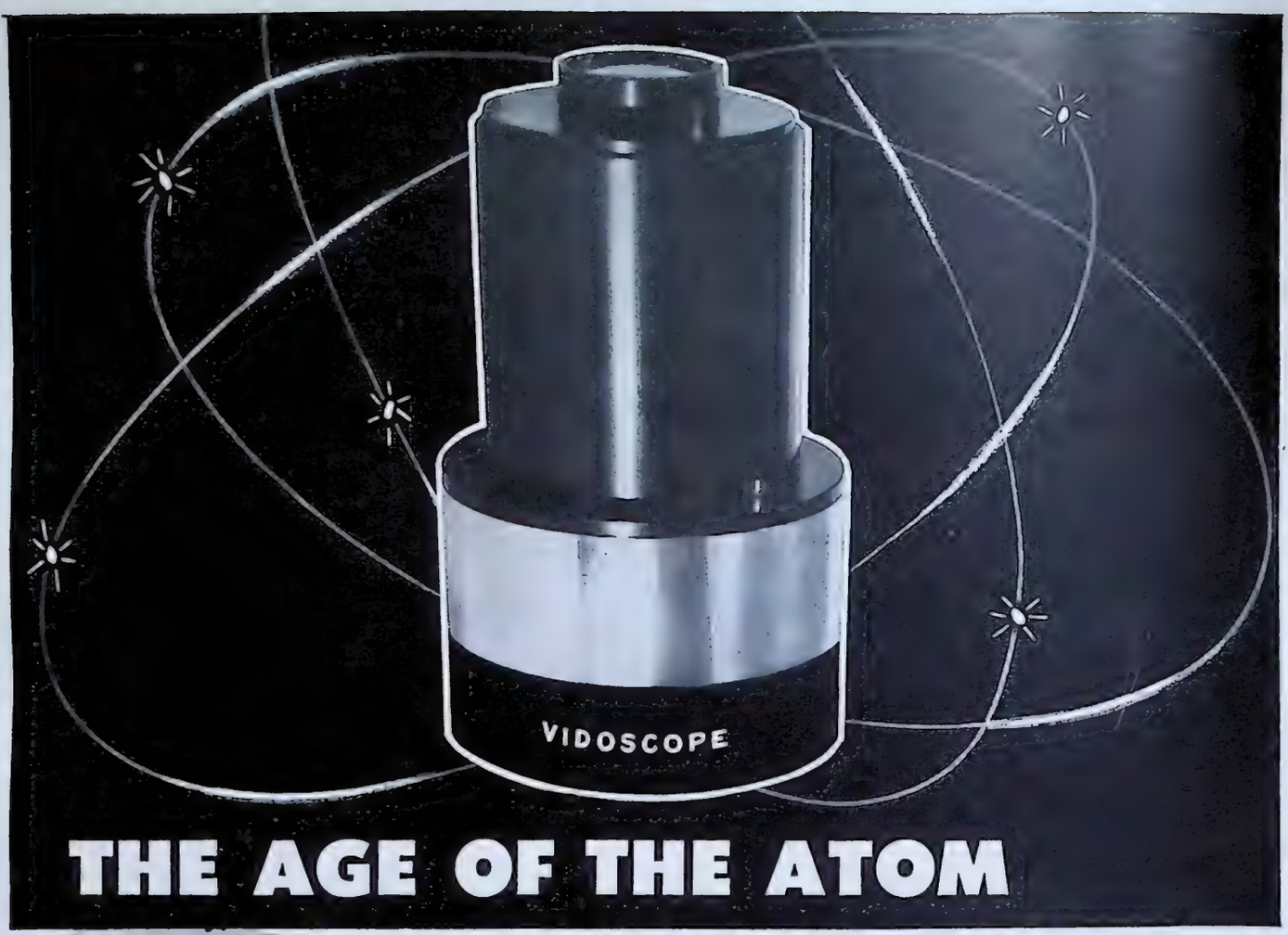
[4] Experimental carbons burned with short protrusion in experimental water-cooled silver jaws.

The term "National", the Three Pyramids device and the Silver Colored Cable Strand are registered trade-marks of Union Carbide and Carbon Corporation

NATIONAL CARBON COMPANY

A Division of Union Carbide and Carbon Corporation • *30 East 42nd Street New York 17, N. Y.*

***Sales Offices:* Atlanta, Chicago, Dallas, Kansas City, New York, Pittsburgh, San Francisco. • IN CANADA: Union Carbide Canada Limited, Toronto**



THE AGE OF THE ATOM

GIVES YOU VIDOSCOPE

THE WORLD'S FINEST LENS

SUPER KIPTAR *for Wide-Angle, Short-Focal VistaVision and Wide Screen.*

— ALL SIZES —

These are the lenses used in all the large circuits. They have earned highest honors in performance and rigidity throughout more than 2000 theatres.



VIDOSCOPE ANAMORPHIC (illustrated) $895 per pair Complete With Special Carrying Case

A COMPLETE LINE OF PRECISION-MADE OBJECTIVE LENSES

WALTER FUTTER

625 Madison Avenue
New York 22, N.Y.

Tel: MU 8-8757 • Cable: *WALFUTTER*, New York

BOOK THREE:
Management

Methods, Practices, and Maintenance

AIR CONDITIONING: A VITAL LUXURY 322
Three Leading Manufacturers Offer Important Information About Air Conditioning and its Vital Role in Exhibition

THEATRE HEATING AND COOLING SYSTEMS
C. F. Craigie, Jr. 329
Valuable Information About the Operation and Maintenance of Heating and Cooling Systems in Motion Picture Theatres

BE UNIFORM WISE.....*Howard A. Zeimer* 332
A Discussion of the Latest Trends in Uniforms for the Theatre Staff, Plus Hints on Styles and Proper Maintenance Procedures

THEATRE AIR CONDITIONING.....*R. D. McLain* 335
A Review of Basic Air Conditioning Systems and A Summary of the Latest Advances Made in Equipment

KEEP THEATRE AIR CLEAN..... 339
Electronic Cleaning of Air in a Theatre, Can Mean Increased Patronage and Reduced Maintenance Costs

THEATRE FIRE PROTECTION.....*Walter E. Morgan* 341
The Vital Task of Knowing What to Do In Case of Fire and the Equipment Needed is Outlined

FURNITURE RESTS CAN SAVE FLOORS..... 344
The Use of Simple and Inexpensive Furniture Rests in Theatres can Sharply Reduce Repairs and Replacement of Floor Coverings

NETWORKS FOR THEATRE TELEVISION.....*C. A. Bartlett* 345
A Study of the Bell System's Part in Providing Channels to be Used for Theatre Television Network Transmissions

New Products, Supplies and Supply Dealers

NEW INTRODUCTIONS DURING 1953-54..... 356
Some Thumbnail Descriptions of Selected Products with Interesting Possibilities

SUPPLY DEALERS OF THE UNITED STATES..... 363
Comprehensive Listing of Names, Addresses, Personnel, Products, and the Areas Served

SUPPLY DEALERS OF THE DOMINION OF CANADA..... 372
Comprehensive Listing of Names, Addresses, Personnel, Products, and the Areas Served

SUPPLY DEALERS OF THE REST OF THE WORLD..... 373
Comprehensive Listing of Names, Addresses, Personnel, Products, and the Areas Served

Extra Profits

LIQUID ASSETS 384
Proper Equipment and Correct Sales Approach Can Make Beverages One of the Most Popular, and Profitable Concession Stand Items

CONCESSION MERCHANDISING.....*Ralph Pries* 389
Proper Exploitation of the Angles at a Theatre's Snack Bar Will Mean an Increase in Extra Profits

CONCESSIONAIRES VS. SELF-OPERATION.....*Philip Kates* 393
The Advantages of Both Types of Management in Extra Profits Departments are Carefully Treated by an Expert in the Field

Indexes

COMPLETE SUBJECT INDEX TO 1954-55 EDITION..... 400
The Entire Editorial Material is Indexed and Cross Indexed for Easy Reference Use

CUMULATIVE INDEX TO ALL PREVIOUS EDITIONS.... 402
Topical References to All Articles Published in Prior Volumes of THEATRE CATALOG

Advertising:

A

ALTEC SERVICE CORP..... 353

B

BERLO VENDING CO..... 398

C

COCA-COLA CO., THE..... 397

D

DAYTON SAFETY LADDER CO..... 352

E

ELECTRIC-AIRE ENGINEERING CORP..... 349
EXHIBITOR, MOTION PICTURE..... 382

G

GENERAL ELECTRIC CO. (LAMP DIV.)..... 350
GOLDBERG BROTHERS..... 351

N

NATIONAL SCREEN SERVICE CORP..... 354
NATIONAL THEATRE SUPPLY..... 362
NATIONAL THEATRE SUPPLY EXPORT..... 377

R

RADIO CORP. OF AMERICA (RCA INTERNATIONAL DIV.)..... 379

W

WESTREX CORP..... 381

METHODS, PRACTICES *and* MAINTENANCE

1954-55

Air Conditioning: A Vital Luxury

Three Leading Manufacturers Offer Important Information About Air Conditioning and its Vital Role in Exhibition

TYPHOON

The year was 1909, the season was summer . . . and one of the strongest traditions in the theatre business was broken.

You may remember how, in those days, legitimate theatres and vaudeville theatres invariably closed during the summer months. It was a tradition as old as the theatre itself . . . and there wasn't any superstition about it, either: it was simply too hot to stay open!

But the economics of the young and vigorous motion picture industry, which was just beginning to feel its oats in the nickelodeons of 1909, *demanded* that business be operated on a year-round basis . . . and it was in response to that demand that Typhoon tackled the tradition of midsummer shutdown, and eventually produced one of the earliest practical theatre cooling systems. The rapid development of such systems helped to make possible the growth of the nickelodeon into the modern, luxurious motion picture theatre of today.

A Pioneer

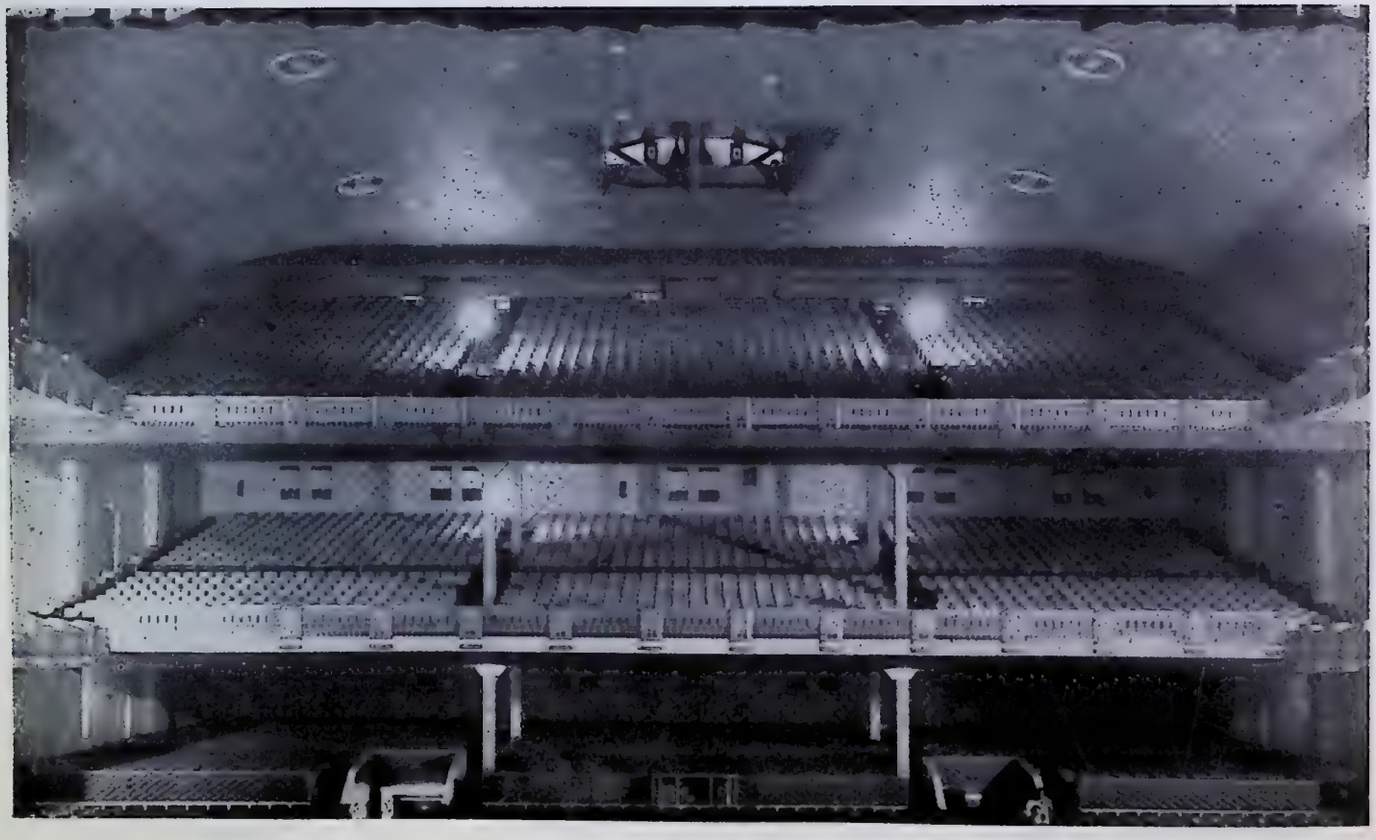
Thus Typhoon became a byword for comfort in those early days of the motion picture and later, as it became feasible to cool theatres through refrigeration, Typhoon pioneered in many phases of what we now know as air conditioning. Typhoon was the first to offer a 10 H.P. packaged free-standing unit for theatres; soon afterward, Typhoon developed even larger units which could be installed either in the conditioned area or remotely. Today, almost half a century after its early triumphs in human comfort engineering for theatres, Typhoon is still one of the leading suppliers of packaged air conditioning equipment to the theatre trade. And, more and more, theatre operators are turning to the use of packaged systems in place of central station systems.

Previously, air conditioning was a luxury that only the larger, richer theatres could afford . . . air conditioning meant a tremendous expenditure for equipment alone, and there were usually considerable alteration and redecoration expenses as well. It is no exaggeration to say that the packaged unit brought the benefit of air conditioning to the smaller theatre.

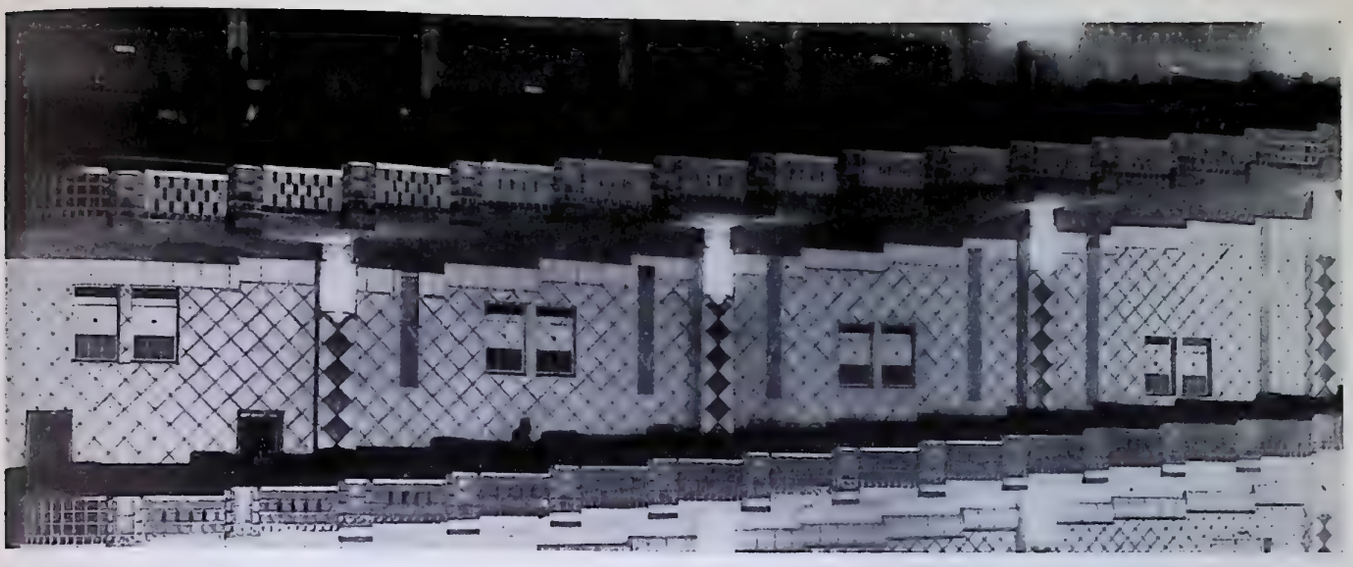
In those early days of theatre air conditioning, only 3, 5, and 7½ H.P. units were available until, partially to satisfy the demands of theatre operators and partially to answer the needs of commercial business, Typhoon developed the 10 H.P. packaged unit, and later provided 15 and 20 and finally 25 tons, still in a single free-standing unit that could be applied without ductwork. Thus, where at first packaged units were practicable only for small theatres of 600 to

BRIEF: ***The successful operation of a motion picture theatre today depends almost as much on the services furnished the patron . . . as on the entertainment offered on the screen . . . One item which can no longer be considered as a luxury is air conditioning . . . The public now demands this service in its shops and homes . . . as well as in the theatre . . . and the house that is not equipped to properly present this convenience will have a difficult time staying in business.***

This article offers the exhibitor an opportunity to refresh his memory on the fundamentals of theatre air conditioning . . . as well as to learn what new advances have been made . . . and how they may be adapted to his particular situation . . . The material was furnished by three of the leading manufacturers of air conditioning equipment . . . and thoroughly covers the field.



VIEW from the stage of Teatro Blanquita, Havana, Cuba, shows 18 Typhoon self-contained units beneath the first and second balconies.



ANOTHER view of Teatro Blanquita shows eight Typhoon self-contained units on the left wall located between the first and second balconies.

800 seats, Typhoon's later applications proved that many larger theatres could now benefit from the advantages of packaged air conditioning.

Operating Economy

What Are Those Advantages?

The major advantage, of course, is cost, Installation of the equipment itself is considerably less costly, and much if not all of the ductwork is eliminated, together with the alteration and redecoration charges mentioned above. This is important, since in the case of many theatres — small ones, especially — the cost of installation alone decides the question of whether or not to air condition. Another important factor is that engineers are often required to attend central plant installations, whereas packaged equipment can usually be maintained by the theatre manager.

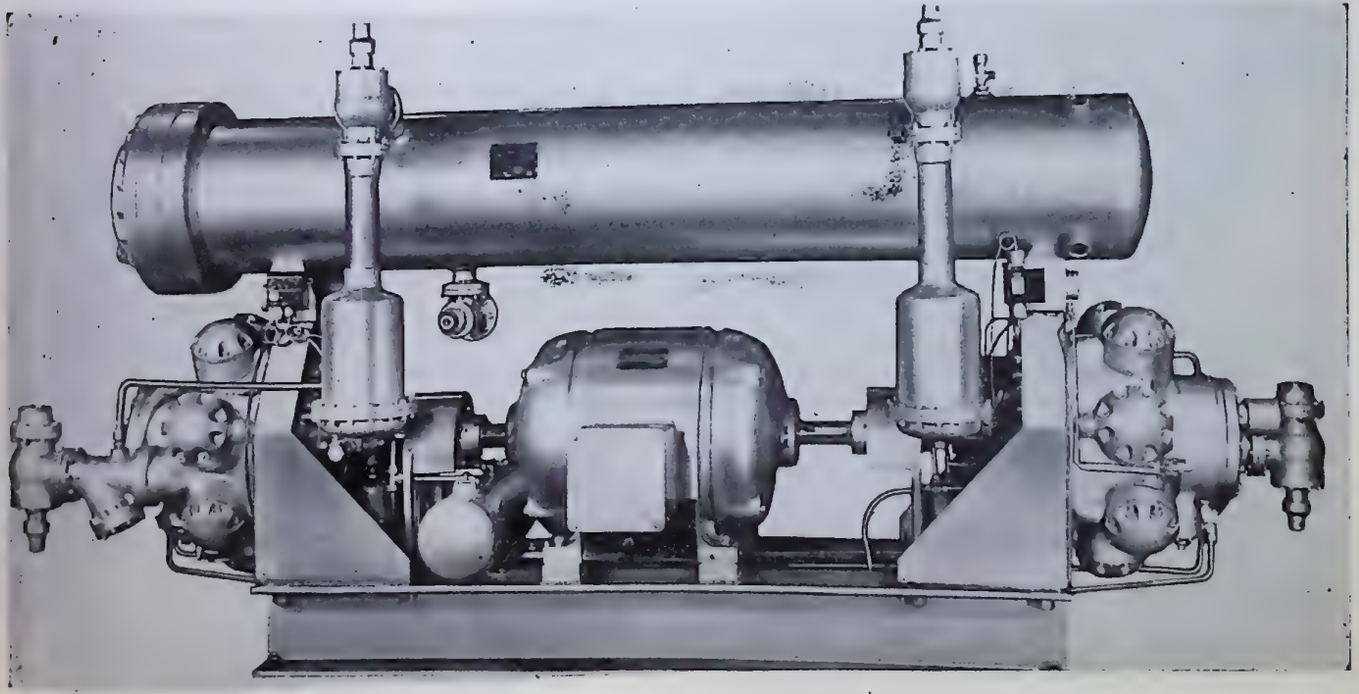
The operating economy of packaged systems is another point on which many a sale has been made. With packaged units, there is no loss of cooling through ductwork, and also no problem of condensation on ducts. In addition, packaged units cool only the actual seating area, as opposed to the central plant with ceiling discharge, where the entire building is cooled. As one Typhoon salesman put it: "Why cool the ceiling? You can't sell tickets up there!"

Perhaps the most important benefit of a packaged system is the "Zone-Control" feature. Since each unit is controlled by its own separate thermostat, the theatre is broken up into cooling "Zones," and a particular unit will operate only when cooling is required in the seating "Zone" served by that unit. Once again, there is an economy factor . . . "Zone-Control" cools customers, not empty seats. Moreover, in cases where patrons are not evenly distributed throughout the theatre, "Zone-Controlled" units adjust themselves to the situation, thus avoiding the complaint that it is too cool in one spot and too hot in another.

One last feature of Typhoon packaged units may be mentioned . . . long experience with theatres and theatre problems has enabled Typhoon to provide a packaged unit that is outstanding for its quiet performance . . . a unit so free from noise and vibration that you will find it installed right in the seating areas of theatres throughout the country.

In the largest theatre in the world— the Teatro Blanquita, in Havana, Cuba, 50 Typhoon "Zone-Controlled" package-units are cooling 6700 seats, efficiently and quietly. So don't let anybody tell you there is a limit to the size of a theatre that can be air conditioned with

A TYPICAL Chrysler central station compressor. Especially adaptable to larger theatres, this type of system has been used in many theatres.



packaged units . . . we've done it in the biggest theatre in the world!

CHRYSLER

Remember the frosty, icicled theatre banners of 15 or 20 years ago that frigidly proclaimed "20 Degrees Cooler Inside"? A few will be resurrected and used again this season. Unfortunately, however, they are antiquated. Also important, because of changed concepts on the part of the American public, they will tend to "discourage" rather than "encourage" patronage.

Engineer the Air

Why? Because today the term "cool," while perhaps having a special meaning for a certain group of music lovers, has for the majority of people an unpleasant connotation. To a good many individuals, "cool" when used descriptively in conjunction with air conditioning implies chilly, unhealthful, annoying drafts. The stigma, while the concept is of course erroneous, dates back two or more decades when the blowing of cool air was incorrectly titled air conditioning. Modern theatre air conditioning equipment does not simply lower the temperature of the air. It comfortizes or engineers the air! It cleans, filters, circulates the air, removes excess moisture and ventilates. Temperatures are automatically controlled and humidity properly balanced. Well planned and well installed air conditioning systems provide maximum comfort benefits for patrons (as well as reducing maintenance cost for theatre owners). Complete comfort is provided, minus any disturbing sensation of chilliness caused by either drafts or extreme temperature variations.

Along with other phases of modernization, air conditioning is assisting the theatre industry to return once again into the unlight of optimism. The patronage picture is brightening.

Air Conditioning Important

Is air conditioning important? Indeed it is! An increasing number of moviegoers work in air conditioned surroundings, live in air conditioned homes, dine in air conditioned restaurants. More and more are even driving air conditioned cars. Naturally, of an evening, when an attractive movie bill catches their attention, they expect the theatre's facilities to be on a par with the comfort standards to which they have become accustomed. Theatre owners and operators, their product being entertainment, need not be advised, however, as to what the public desires. From years of experience they know! Therefore, especially this season, they are investing millions on new equipment, and on overall refurbishing of facilities. The outlay is tremendous, but attendance increases prove that dividends are resulting. Comfort and air conditioning yearly grow more synonymous.

A CHRYSLER Airtemp 15 ton, completely self-contained packaged air conditioner. Units of this type, in sizes from 2 to 15 horsepower, easily installed in new or existing theatres, provide utmost in comfort.



Popular Systems

For the theatre the two most popular methods of air conditioning are the centralized system and the "packaged" or unit system. The former utilizes a built-up or tailor-made apparatus and a single large refrigeration compressor. Overhead distribution of conditioned air is generally employed with the air introduced by means of decorative ceiling plaques for circular prefabricated metal ceiling outlets. A system of returns from the front or rear or from "mushrooms" under the seats is utilized to return the air to the central air conditioner. Positive introduction of outside air through the conditioner for ventilation purposes is always provided. In this system adequate space for a machine room must be provided, as well as space for a trunk supply-air duct and return-air duct.

The other method of air conditioning, employs self-contained "packaged" air conditioners ranging in size from 2 through 15 h.p. These packaged air conditioners contain all of the functional parts of the centralized system in one pre-assembled unit. Only utility connections and short air distribution and return systems need be attached to complete an installation.

Selection Factors

Centralized systems are generally utilized in theatres of 1,000 seats or more. Packaged units are used more extensively in smaller, neighborhood houses. Installations combining both types are also made. Similarly, because of their flexibility, packaged air conditioners can be found in many of the nation's larger theatres. Selection of either type of system is based on a number of factors; including, size of the area or areas to be air conditioned, space available for the installation of equipment, physical makeup of the building, cost and feasibility of installing duct work. Another determining factor is whether or not complete air conditioning is to be installed at one time or over a period of years. (Perhaps the auditorium the first year and lobby or offices during subsequent seasons.) In the latter case, packaged units have been the answer for many faced with the problem of installing needed air conditioning on a limited, yearly budget.

Both types of systems; that is, the centralized system and the packaged unit system are designed to give the same results—the same temperature and humidity. Both systems occupy practically the same space. The main difference is in the equipment itself.

As a number of neighborhood theatres are now or in the near future will be contemplating air conditioning, a few additional notes on the packaged-type system perhaps would be helpful.

Packaged System

From the stadpoint of an investment, the packaged system has the advantage of employing standardized factory-built equipment. The equipment can be considered as a fixture and a large percentage of the investment is in the form of the complete packaged unit with a known value. This equipment is movable.

In case of additions or alterations to the theatre, the packaged unit system can be easily added to without destroying any of the value of the original investment. Packaged units were developed for unattended operation. There is only one switch to turn on and off. Compact operating mechanisms are fully enclosed in an attractive cabinet. There is no exposed wiring and the unit is not subject to tampering. It can be employee operated as it is completely automatic and self-contained.

In case one of the units should fail, the system would still operate at slightly reduced capacity, no costly shutdown would result and the theatre would not be without air conditioning until repairs or replacements could be made. The units are quiet, vibrationless and economically maintained.

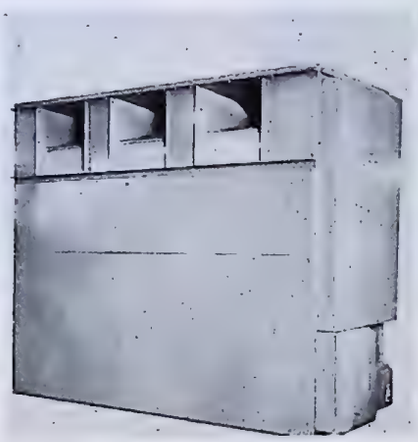
The compressor of each packaged air conditioner operates only as the heat load in its own area requires. This means that only as much horsepower is in use as the load requires, which fact is reflected in operating costs.

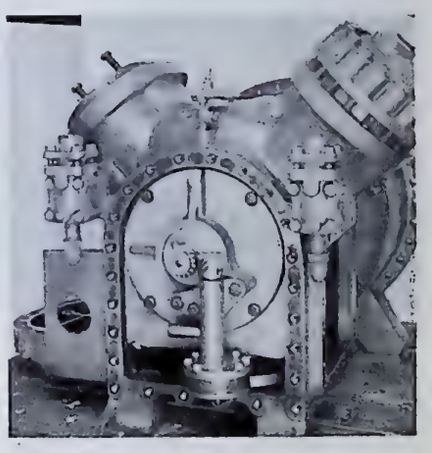
Packaged units have been particularly designed to eliminate maintenance and service. The compressor is of the hermetically-sealed type with built-in motor. The entire compressor operates with a forced lubrication system in a bath of oil, thus providing long life and minimum maintenance. Some of these compressors have operated as long as 25,000 hours, or approximately 20 years service, without noticeable wear or reduction in capacity. Any commercial service man can easily service this equipment and parts and service are immediately available. Records of operation on this equipment show a remarkable low operating maintenance cost, with very few failures.

During the past 20 years the American pattern of living has changed tremendously. A continuous stream of new inventions and developments has fashioned entirely new concepts of what could be termed 20th century living. Modern air conditioning is one of many products enabling us to live better, in greater comfort, and to extract more enjoyment from our leisure entertainment.

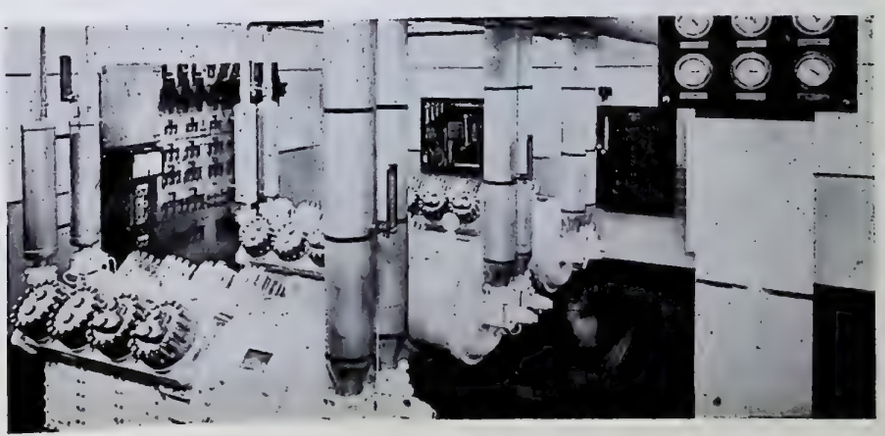


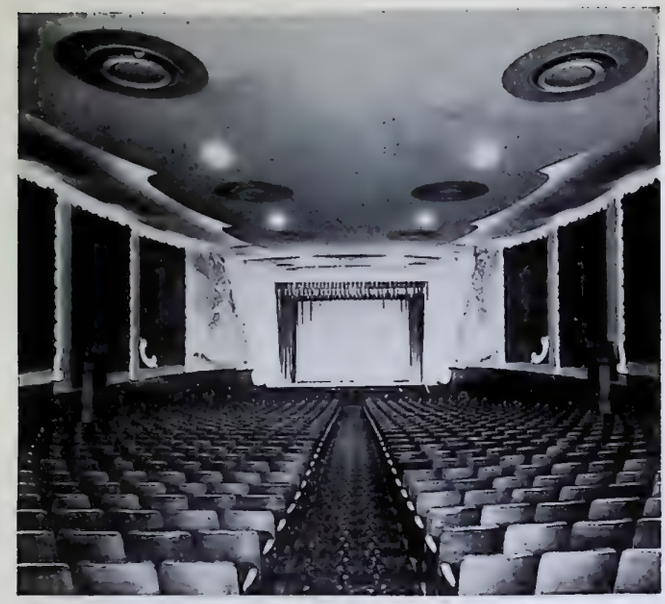
A 10 HORSEPOWER Westinghouse unit (above) set up for within the space air conditioning. Another model (below left) of a self-contained unit. A compressor (right below) showing the oil pump.



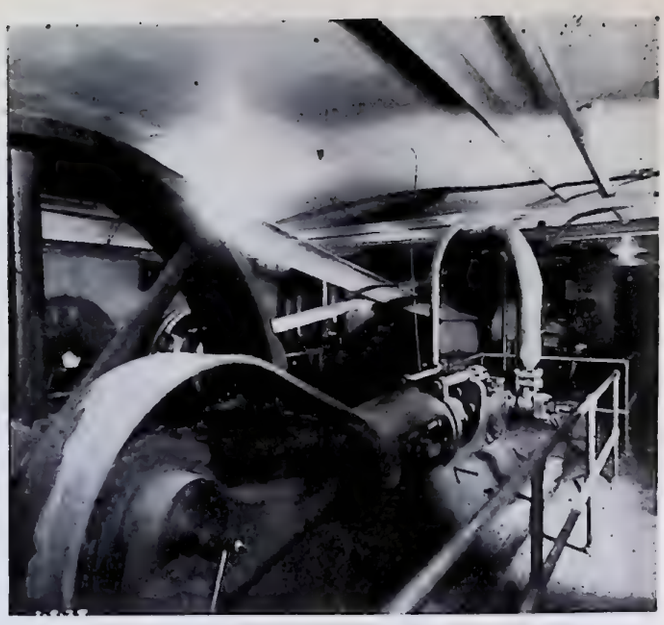


A TYPICAL Westinghouse air conditioning equipment installation employing three 100 h.p. compressors.

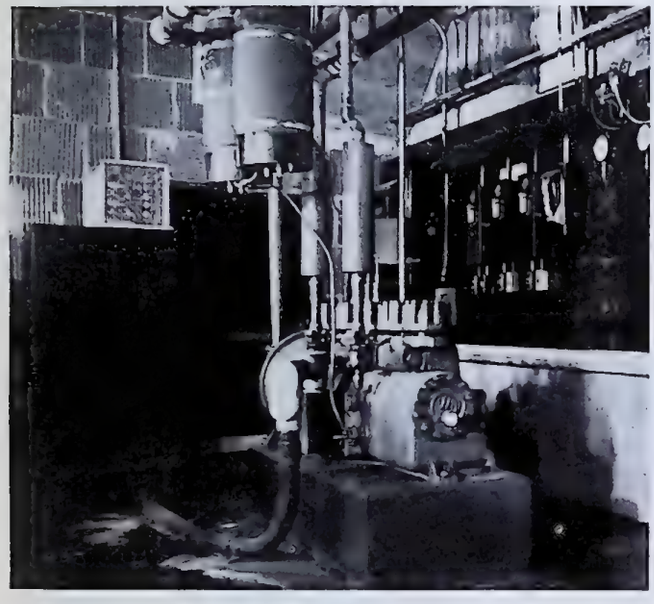


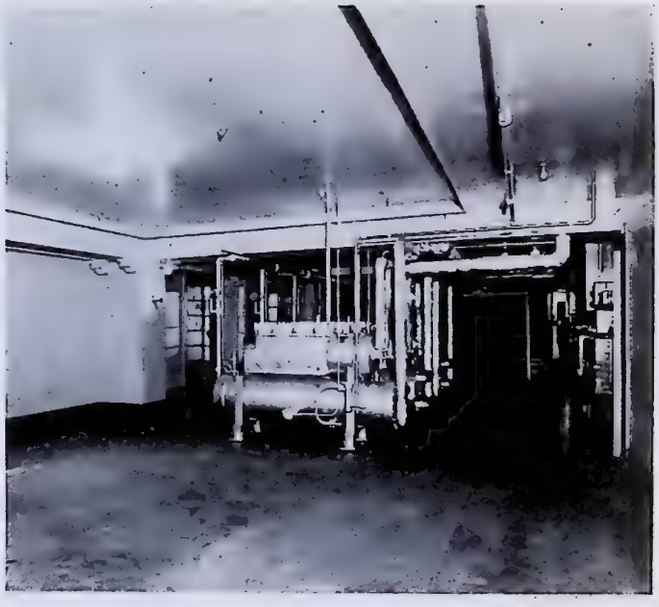


BEAUTIFUL AUDITORIUM of the Daniel Webster, Nashua, N. H., (above). Note the attractive design of ceiling with supply outlets. The machinery room of this theatre (below). Note neat arrangement of the compressor.



THE MACHINERY room of the State-Lake Theatre, Chicago, showing huge old fashioned belt-driven units (above). The same room (below) showing the savings in space and weight with new Westinghouse compressors.





WESTINGHOUSE

The widespread utilization of mechanical refrigeration systems by the theatre industry has to a large extent been responsible for acceptance of comfort air conditioning and the many improvements which have been of benefit to the user of air conditioning equipment. The large theatres were the first to proclaim the advantages of their air conditioning installations, many of which operated without adequate temperature control thus creating a wonderfully cold inside for the patrons, along with a delightful blast of cooled air covering the sidewalk area in front of the theatre. The small neighborhood theatres necessarily adopted air conditioning and were forced to economize on operation and installation costs due to their seating capacity.

Air conditioning application technique and new developments, along with experience rapidly developed installations which were economical in first cost and operating cost.

A Challenge

Air conditioning of modern theatres has become one of the most challenging applications throughout the industry. Strict attention must be given not only to temperature, humidity, and air distribution, but to the avoidance of overcooling, noise, warm or cold areas, drafts, hot and cold stratification, odors, and leakage through doors.

An indoor relative humidity between 50 per cent and 55 per cent is generally accepted as best condition as concerns equipment cost, human comfort, and odor prevention. Indoor design temperature may be anywhere between 73 degrees F and 80 degrees F, depending on outside dry bulb temperature. The necessity for careful expense control makes the selection of air conditioning equipment for a replacement installation or a new installation a major consideration for the theatre operator.

Obviously, a theatre in a residential district operating evenings with matinee performances once or twice a week cannot afford to install as heavy air conditioning equipment as would be required for a theatre located in a shopping center and running continuous daily performances.

The outlying theatre can use package type unit air conditioners which are completely self-contained air conditioning systems. In addition to capacity for cooling, they are equipped with fans for air circulation and ventilation, they accomplish dehumidification, and are also equipped with filters to clean the air. They will also supply heating and humidification by the addition of standard accessories, and are so constructed that automatic temperature and humidity control can be utilized. Units are available in a wide range of sizes. The self-

AIR CONDITIONING & REFRIGERATION CHECK CHART-RECORD OF INSPECTION

WESTINGHOUSE FORM 20218 A

DATE OF INSPECTION

CUSTOMER | ADDRESS

SYSTEM IDENTIFICATION | COMPRESSOR TYPE NO. | SERIAL NO.

COMPRESSOR

DISCHARGE PRESSURE PSI | DISCHARGE TEMPERATURE °F. | DISCHARGE SUPERHEAT °F. | LIQUID FREON TEMPERATURE °F | HIGH PRESSURE CUTOUT AT——PSI LOW PRESSURE CUTOUT AT——PSI

SUCTION PRESSURE PSI | SUCTION TEMPERATURE °F. | SUCTION SUPERHEAT °F. | OIL PRESSURE PSI | OIL LEVEL ⬡ | OIL CLEAN YES ☐ NO ☐

OIL FOAMY YES ☐ NO ☐ | FREON SIGHT GLASS FULL YES ☐ NO ☐ | FREON COLOR CLEAR ☐ LIGHT AMBER ☐ DARK AMBER ☐ | OIL SEPARATOR RETURN LINE WARM YES ☐ NO ☐ | EXPANSION VALVES ADJUSTED YES ☐ NO ☐

ARE UNUSUAL NOISES PRESENT YES ☐ NO ☐ EXPLAIN—

IS UNLOADER OPERATION CORRECT YES ☐ NO ☐ EXPLAIN—

RECOMMENDATIONS

CONDENSER

WATER COOLED ☐ | WATER IN °F. | WATER OUT °F | IS STRAINER CLEAN YES ☐ NO ☐ | WATER PRESSURE PSI | DOES WATER VALVE SHUT OFF YES ☐ NO ☐ REPAIRED ☐

EVAPORATIVE CONDENSER ☐ OR COOLING TOWER ☐ | WATER IN °F. | WATER OUT °F | IS WATER LEVEL CORRECT YES ☐ NO ☐ | WATER PUMP NOISY YES ☐ NO ☐ | IS PUMP CLEAN YES ☐ NO ☐

IS STRAINER CLEAN YES ☐ NO ☐ | WATER PUMP LEAK YES ☐ NO ☐ | ARE SPRAYS CLEAR YES ☐ NO ☐ | IS OVERFLOW OPEN YES ☐ NO ☐ | ARE COILS CLEAN YES ☐ NO ☐

NOTE CONDITION OF BELTS AND PULLEYS

LUBRICATE—MOTORS | BEARINGS

RECOMMENDATIONS

LOWSIDE (INCLUDING AIR HANDLING UNIT OR PLENUM)

FAN		FILTERS		GRILLES		WALLS		COILS		DRAIN	
CLEAN	DIRTY	CLEAN	DIRTY	CLEAN	DIRTY	CLEAN	DIRTY	CLEAN	DIRTY	CLEAN	DIRTY

ARE UNUSUAL NOISES PRESENT YES ☐ NO ☐ EXPLAIN—

IS REFRIGERANT DISTRIBUTION UNIFORM YES ☐ NO ☐ EXPLAIN—

NOTE CONDITION OF BELTS AND PULLEYS

LUBRICATE—MOTORS | BEARINGS

RECOMMENDATIONS

HEATING | **HUMIDIFYING**

STEAM PRESSURE PSI | AUTOMATIC VALVES O.K. YES ☐ NO ☐ | TRAPS O.K. YES ☐ NO ☐ | MANUAL VALVES O.K. YES ☐ NO ☐ | HUMIDIFIER NOZZLES CLEAN YES ☐ NO ☐ | HUMIDIFIER SOLENOID VALVES O.K. YES ☐ NO ☐

RECOMMENDATIONS

PRECIPITRON

POWER PACK | TUBES OPERATE PROPERLY YES ☐ NO ☐ | WIRING CONNECTIONS GOOD YES ☐ NO ☐ | DOOR INTERLOCKS FUNCTION PROPERLY YES ☐ NO ☐

CELLS (CLEANED ☐)

ELECTRICAL CONNECTORS TIGHT		PLATES		INSULATORS	ARCS
YES	NO	BURNED ☐ LOOSE ☐		CLEAN ☐	NONE ☐
		BENT ☐ OUT OF SLOTS ☐		DIRTY ☐	INTERMITTENT ☐
		WARPED ☐		CHIPPED ☐	CONTINUOUS ☐
		CLEAN ☐ THIN DEPOSIT ☐		CRACKED ☐	BETWEEN PLATES ☐
		DULL ☐ THICK DEPOSIT ☐		BROKEN ☐	AT PLATE SLOTS ☐
		SHINY ☐			AT INSULATORS ☐

IONIZERS (CLEANED ☐)

ELECTRICAL CONNECTORS TIGHT		IONIZER WIRE BROKEN & REPLACED		IONIZER WIRE PROPERLY STRUNG		IONIZER WIRE CENTERED		INSULATORS	ARCS
YES	NO	YES	NO	YES	NO	YES	NO	CLEAN ☐	NONE ☐
								DIRTY ☐	INTERMITTENT ☐
								CHIPPED ☐	CONTINUOUS ☐
								CRACKED ☐	AT INSULATORS ☐

(OVER)

SEEN HERE is a typical Westinghouse inspection chart for air conditioning system maintenance.

contained package type units are adaptable to many locations, either inside or outside the structure, at the rear of the house or at the side of stage, in basements or on the roof, and can supply air with or without ducts depending on their final location.

Peak Load Method

The "peak load" method of application engineering may also be used to economical advantage in small outlying theatres and others running one matinee and one evening performance, or one performance per day. A well qualified engineer should be engaged to engineer and supervise such applications.

Another Method

Another economical method of cooling theatres running one or two performances daily is the "latent heat ice storage" system. This method uses much smaller mechanical refrigeration apparatus than would be required for direct mechanical refrigeration air conditioning systems. The installed machinery makes ice during no load hours which is used to condition the space during peak load hours. In some applications the ice and machinery are used together during peak loads.

The economical first cost of latent heat ice storage systems may be seen in the following example:

A theatre requires a total of 200 tons per hour for two hours. Total 400 ton hours or 4,800,000 BTU. The ice required to provide 4,800,000 BTU and to cool the space is produced over a certain number of shut-down hours.

For a direct cooling system the compressor(s) would have a capacity of 2,400,000 BTU/hr. or somewhat less if sized according to peak load requirements.

If 10 hours were chosen as the ice recovery period in a latent heat ice storage system, then: 4,800,000/10 = 480,000 BTU/hr. required capacity of compressor. The difference in required capacity affords a substantial reduction in compressor first and operating cost even though ice tanks must also be installed.

Central Station

Where the construction of the theatre and its capacity require large central station type air conditioning apparatus located in a machinery room, many equipment variations may be used. Refrigeration machines are available in many ranges of capacity and are physically smaller than formerly. Compressors are equipped with capacity controllers which are actuated by means of house temperature. The compressor may be located in one space with the coils and fans above the ceiling, or on the roof, with ducts supplying the air to the theatre. Water towers or evaporative condensers are available to minimize operating costs.

Many excellent articles covering engineering applied to psychometry and apparatus selections have been presented in this publication. The exhibitor is advised to retain a competent heating and ventilating consulting engineer prior to opening negotiations for the air conditioning system to be installed. Thus you will be able to secure adequate apparatus for your needs in full compliance with local codes and regulations.

Recently many houses have undertaken the replacement of obsolescent air conditioning refrigeration apparatus, and have realized substantial savings in operating cost by elimination of the need for an operating engineer. Recent replacement installation in southwestern



SKETCH showing how Westinghouse Unitaires may be utilized for moderate-sized theatres.



THIS COMPACT 50 ton Westinghouse compressor provides refrigeration for the Adams Theatre, Dorchester, Mass. Outline on floor is where ice bunker of previous cooling system had been located.

Texas, Colorado, and Philadelphia have resulted in reduction of payroll plus a gain of floor space which was put to other uses.

Do not forget that inspection and maintenance are necessary to protect your investment. The check chart illustrated will be of inestimable value to you and will serve for most systems being installed today.

Air Distribution

There are two general classifications of air distribution in common use in modern theatres. The first is known as the vertical or downward diffusion system, and the second is the horizontal diffusion system. In the first system air is introduced through supply openings in the ceilings of the auditorium and in soffits of mezzanines and balconies.

The horizontal diffusion system introduces the air through side wall outlets and high velocity ejector nozzles are sometimes used to create circulation of a large volume of secondary air. This system has many advantages and a few disadvantages. The main disadvantage being that ceilings and walls must be smooth and free from beams and ornamentation.

A variation of the above, employing supply outlets mounted in the walls 12 to 14 feet above the floor, is rapidly becoming quite popular. This method forms an even stratification of cool air from the floor to the height of the supply outlet and makes no attempt to cool the cubic volume of space between the outlet and ceiling. In many theatres such space is enormous and requires many tons of refrigeration to cool. By forced stratification to a height of 12 or 14 feet a reduction in machinery first and operating cost may be realized. Balconies and mezzanines are treated as separate spaces and air is supplied by ceiling or wall outlets.

The major difficulty to be overcome in cooling balconies is the tendency of cold air to spill over and drop into the occupied space below. This may be prevented by good engineering of outlets and returns.

Projection rooms should always be provided with a separate exhaust to the outdoors with no return to the central return system. Conditioned air may be supplied from the central supply duct system.

ACKNOWLEDGEMENT: *We wish to thank Jerry Bixby, of Typhoon Air Conditioning, Brooklyn, N. Y.; W. B. Cott, Westinghouse Electric Corp. Air Conditioning Division; and J. L. McGarry, Chrysler Corp. Airtemp Division, for furnishing the photographs and material used in the article.*

EXTERIOR VIEW of the Adams Theatre. This house is typical of the many which install modern air conditioning to provide pleasant surroundings.



Theatre Heating and Cooling Systems

Valuable Information About the Operation and Maintenance of Heating and Cooling Systems in Motion Picture Theatres

BRIEF: *Although the two seem to be at opposite poles and purposes . . . the problem of heating a theatre is linked with the cooling of that theatre . . . It is the purpose of this article to discuss some of the major considerations involved in the proper functioning of the various types of heating and cooling systems which have an application in the motion picture theatre.*

There are portions of this article devoted to information about the various kinds of methods available . . . what the principle functions and goals of properly constructed and operated heating plants should be . . . as well as much data which should prove to be a valuable addition to the exhibitor's basic knowledge about this vital part of his theatre.

By C. F. Craigie, Jr.
Plumbing and Heating Industries Bureau

Any consideration of the subject of theatre heating must automatically include its corollary — cooling — since our one system is called upon to perform both functions in providing year-round comfort for patrons.

The classical way to both heat and cool a theatre auditorium is with a fan and blower system. When heat is required, the blower circulates warm air downward through duct openings in the auditorium ceiling. An automatically fired boiler is the source of heat for a heat exchanger coil used to warm the air.

When cooling is required, the blower sends air chilled by refrigeration equipment through the duct system and into the auditorium. For areas such as offices in the theatre building, projection booths, washrooms, and the boxoffice, heat is supplied by conventional heat distributors for a boiler heating system — radiators or convectors, as a general rule.

Sometimes a booster coil and blower are placed across the front entrance doors to eliminate lobby drafts that more often than not are felt by those sitting in rear rows of the auditorium.

Acid Test

The acid test of a well-designed theatre heating and cooling system is imposed by the need for ventilation. There must be frequent and complete changes of air without causing drafts.

A commonly-used type of return air outlet when air is introduced into the auditorium from above, is the mushroom head ventilator, placed at regular intervals on the floor beneath seats.

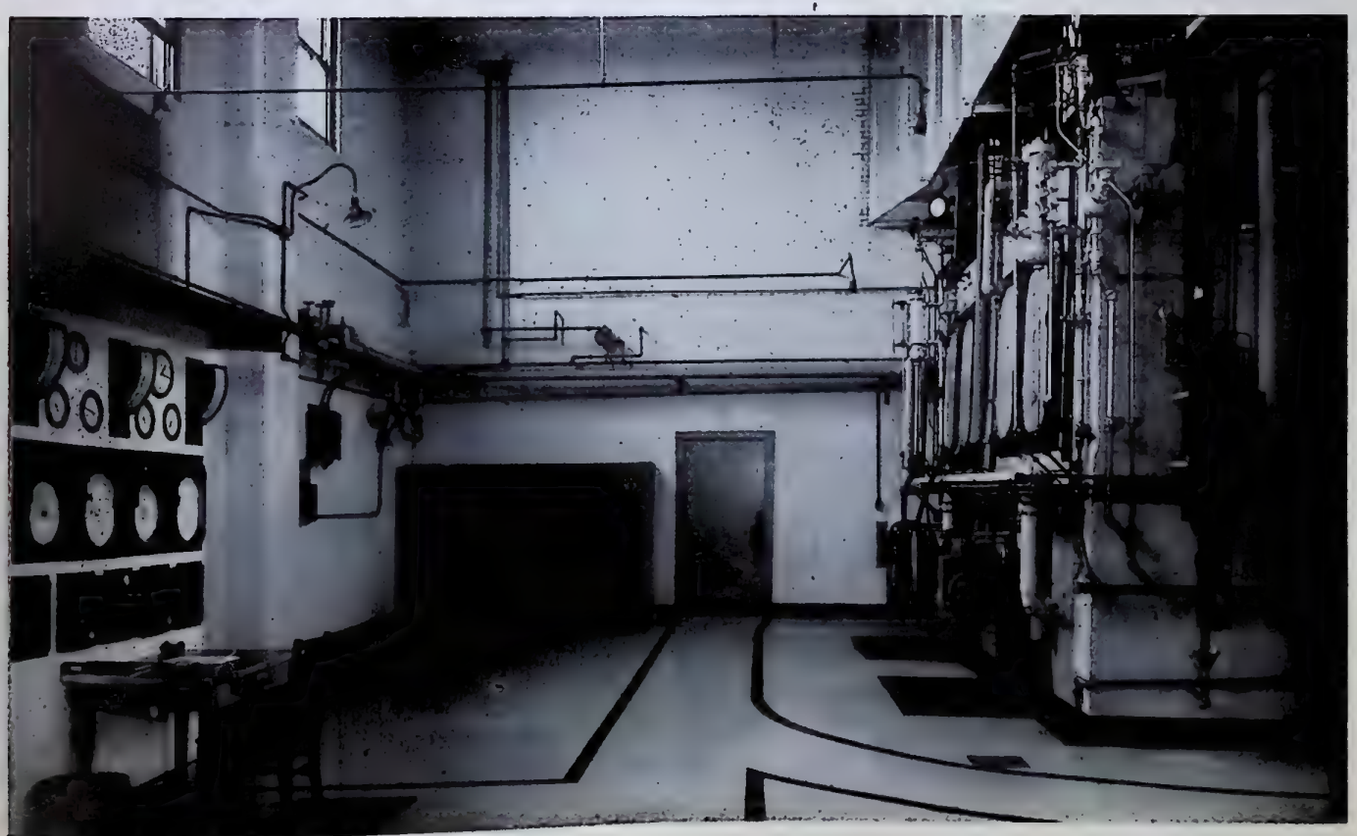
Some theatres are heated and cooled with air introduced at the ceiling and beneath the balcony. The return air is removed by grilles at the rear of the main floor and from an exhaust plenum below the balcony seats.

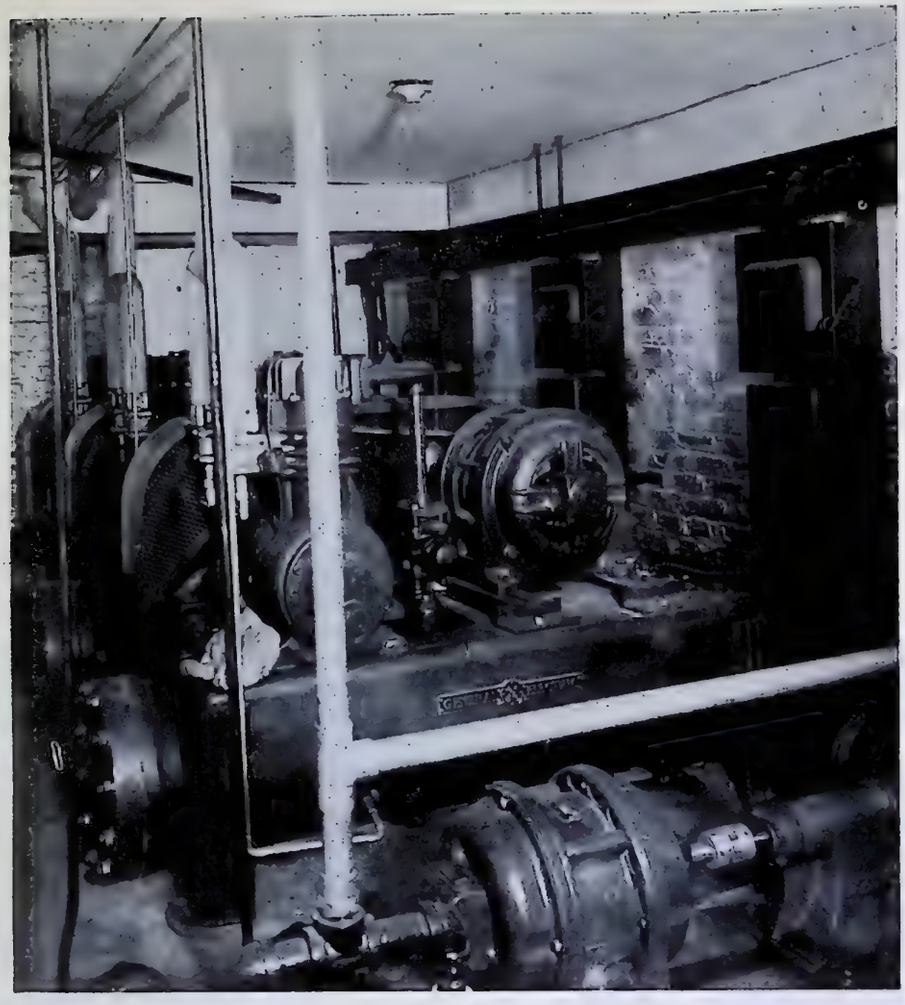
Individual Areas

Certain rooms in a theatre building require more ventilation than others, because of the accumulation of undesirable odors and fumes. In such cases, the air obviously is not recirculated, but rather vented to the outside.

With theatre washrooms, it is sufficient to provide only an exhaust system, leaving windows partially open for replacement of the air supply. Many theatre rooms require no air intake, merely outlets for good ventilation. Enough fresh air enters such rooms through various

THE BOILER room and controls for a modern theatre heating plant. The system is so automatic that the human element is virtually ruled out. It has been found that the more automatic heating is, the better the results. Patrons are more comfortable and management benefits from the efficiency.





HEATING and cooling are related since one system is usually called upon to perform both of these functions. An all-year-around air conditioning system is seen (above). The attractive washroom (below) is heated with convectors placed beneath the windows to meet the cold air as soon as it enters room.

leaks and cracks, making it unnecessary to periodically raise and lower windows.

A minimum of 20 complete changes of air per hour is required for theatre washrooms. Thirty changes is even better. Generally speaking, when the air inside a theatre is moist, cold air from the outside should be preheated before being introduced, to avoid problems associated with condensation.

As far as circulation of air within the theatre auditorium proper is concerned, the objective is the maintenance of uniform conditions in the breathing zone.

Uniform Conditions

A number of difficulties present hurdles in the achievement of this objective. One of these is the tendency to overcool the front of the orchestra floor. Another is the possibility of inadequate cooling in the rear of the balcony, and in the space beneath it. Proper design of the air supply system usually can be counted upon to solve these difficulties satisfactorily.

The return air system should not be depended upon for aid in maintaining uniform temperature within a theatre auditorium. A satisfactory condition results only when the air supplied by the heating-cooling system is introduced at the correct temperature and with the proper moisture content.

Principal Function

The principal function of return air is in reduction of the overall heating-cooling load. When air from the auditorium is recirculated after being washed and filtered, it decreases the amount of outside air which must be taken in and heated or cooled to replenish the supply.



Recirculated air also aids in maintaining the proper air temperature at supply outlets.

For a number of different reasons, the front of the main floor of a theatre may remain cold during the heating season. A frequent cause is infiltration of air through doors located in the auditorium near the stage. Or it may result from a layer of cold air passing downward over the rear stage wall and out into the auditorium.

Any attempt to warm the chilly front section of theatre seats by increasing the air temperature usually is unsuccessful. What happens is that the rear part of the auditorium becomes overheated, while the front remains cold.

The best way to solve this heating difficulty is to install direct radiation near all exit doors and on the rear stage wall if it has an outside exposure. Sometimes radiation is installed in the orchestra pit to block drafts from backstage.

In the summer, an overly cool front section of seats may be prevented by closing all stage doors tightly, and by determining that all vents and skylights in the stage roof are securely fastened and free from air leakage. The slightest amount of air leakage around the stage frequently is all that is required to start an objectionable and drafty forward movement of air.

Automatic Controls

Heart of a theatre heating system is the boiler. Firing, of course, should be automatic with gas or oil burner, or a stoker. This assures close control of heating costs, and eliminates arguments with the janitor over fluctuating house temperatures, the invariable result of hand-firing a boiler.

Automatic temperature controls are necessary in achieving the desired degree of inside comfort during the heating season. There should be both an inside and outside thermostat. The outside control keeps the heating system in tune with weather changes, calling for more or less heat, whichever the case may be. The inside control regulates fuel consumption to correspond to changes in the "human load."

An automatic compensating type of adjustment harmonizes and reconciles the demands of the two thermostats, enabling the heating system to maintain the exact indoor climate desired at any season of the year.

A properly-equipped boiler will have safety controls to guard against the twin hazards of overheating and excessive pressure, besides a low water level cut-off.

The steam and hot water lines of a boiler should be carefully checked for adequate size, pitch and insulation. Particular attention should be directed to any low points in the runs, which could cause objectionable noises.

Typical Example

The Fox Theatre in San Francisco has what may be considered a heating-cooling system typical of the larger type of film palace. The air conditioning room occupies an entire floor nine stories above street level.

Air intake shutters are under automatic control. Each of the 16 supply fans delivers 140,000 cubic feet per minute of air. Eight 14-foot main supply ducts lead from the air conditioning room to various parts of the theatre. Each duct has a series of three steam heaters.

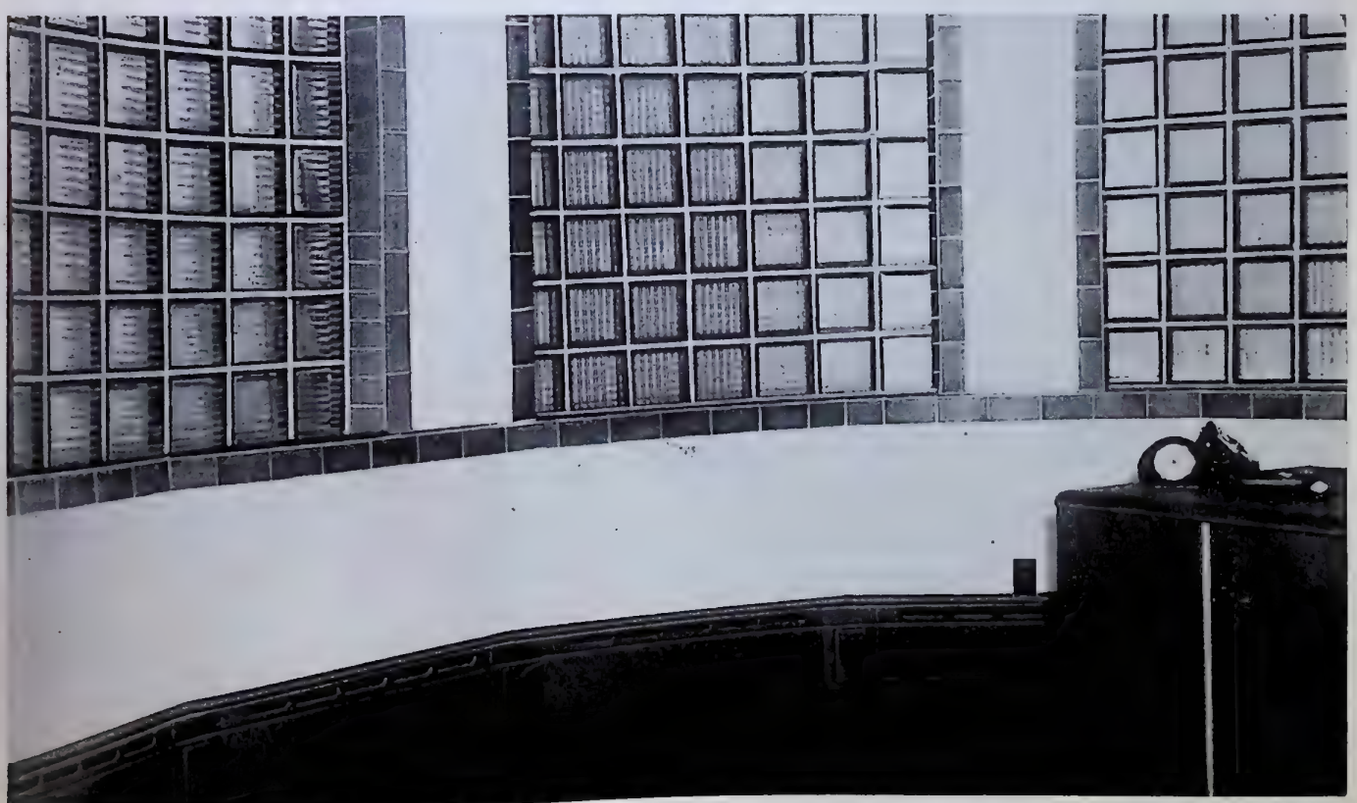
Openings in the highly ornamental plaster-encrusted ceiling, the proscenium arch, and the organ loft distribute conditioned air throughout the auditorium. There are 414 separate openings in this theatre, each with its own damper control.

The boiler room is in the basement 20 feet below sea level. A five by 20 foot tank holds the boiler's fuel oil supply. Oil pumps are equipped with a pre-heater to bring the oil up to the point of combustion.

Deep well water is pumped from the basement to the air washers by pumps operating at 1750 revolutions per minute. Air pressure on hydro-pneumatic tanks is maintained by four compressors. The centrifugal pump is one of two used to raise water from the theatre's own deep well.

The theatre also has a reserve 6,000 gallon hydro-pneumatic air washer system. In case the regular system should break down, the auxiliary system could be used as a standby in an emergency for air washing, fire fighting, or flushing purposes.

BASEBOARD heating units keep the manager's office comfortably warm at all times. Baseboards circulate hot boiler water under thermostatic control. It is easy to clean around baseboards which offer no obstacle to any furniture arrangement desired, besides simplifying laying of floor carpet. Included among some of the advantages of baseboard heating are that it is clean, even, and draftless. As a matter of fact, the temperature is so even in a baseboard-heated room that there is never more than a degree or two of difference between the floor and ceiling levels.



Be Uniform Wise

A Discussion of the Latest Trends in Uniforms For the Theatre Staff, Plus Hints on Styles and Proper Maintenance Procedures

By Howard A. Zeimer
Executive Sales Manager, Delta Uniforms

BRIEF: ***At the present time the entire theatre industry is going through a period of great change . . . and many houses are being refurbished and modernized . . . The wise exhibitor should also see to it that the uniforms of his staff are in keeping with the rest of the changes.***

This article offers a discussion of the latest types of theatre uniforms . . . for the entire staff . . . including the ushers and usherettes . . . the porters . . . ticket taker . . . and cashiers . . . There is also special attention given to the uniform problems of the drive-in theatre.

There is information on the types of materials best suited for specific theatre uniforms . . . One part of this article which should get particular attention is the one devoted to the maintenance of theatre uniforms . . . It would be foolish to spend money to properly attire your staff . . . only to have these garments ruined . . . or have their useful life shortened by improper cleaning or treatment . . . The author attempts to point out some of the most common hazards as well as how to avoid them.

The philosophy of a large circuit's operations manager was, "To make my boys look like West Pointers. As to my girls—well, any old summer blouse, coat, or skirt would suffice. After all, you can't do much with women's theatre uniforms."

How wrong he was. Don't you think if you had a staff of usherettes properly and attractively dressed that you would appeal to your theatre staff? Women's uniforms have always been a serious problem with uniform manufacturers, chiefly due to the improperly designed patterns, and to the inconsistency of producing women's garments in men's shops by workers skilled only in handling of men's garments.

Women's Uniforms

Too few of the uniform manufacturers have completely overcome this problem by operating the production of both men's and women's garments, and, for the most part, establishing two women's shops — one for the production of the mannish tailored military style women's uniform, and the other from the strictly feminine dressmaker style. This requires designers skilled in styling and pattern-making of women's uniforms. Unfortunately, not too many of the uniform companies are so equipped.

IT IS IMPORTANT both for the moral of the staff, and for the impression that it has upon the public that theatre personnel be properly uniformed such as this staff at the Warner Cinerama Theatre, NYC.

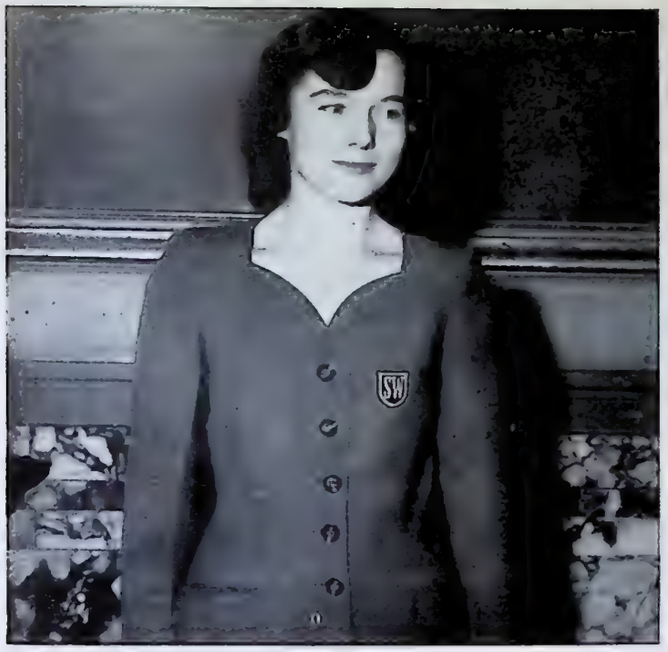


To exemplify this trend, the Sweetheart neckline cardigan jacket and airline stewardess type uniform coat were especially designed and manufactured for the Stanley Warner Management Corporation female personnel. The cardigan jacket has met with widespread acclaim as a complete departure from the common stereotyped unlined cashiers' blouses which have been in existence since 1928. A photograph of these uniforms taken at the Mastbaum Theatre in Philadelphia, which were designed and executed by the Delta Uniforms Division of Highway Outfitting Company, Inc., are shown here, illustrating the new trend.

Theatres showing Cinerama throughout the United States have adopted an innovation in usherettes' uniforms. A smart vest type cardigan jacket with a dacron and rayon man-made fabric, has been used for the first time in theatre uniforms.

Men's Uniforms

For men the style runs from ultra smart uniforms with tail coats in deluxe houses, to the simpler type of Eaton jacket and double breasted coat, invariably having a two-tone effect, combining light-pastels with a darker color. This is best illustrated by the photograph of men's uniforms showing these various contrasting styles.





SWEETHEART neckline cashiers' jackets (above left) are worn by all Stanley Warner cashiers for winter attire. Usherettes at Mastbaum, Philadelphia, wear new style hostess type usherette uniform coat and skirt (above right). Uniforms of Baylan Theatres (below), Tampa, Fla., please.



Drive-In Uniforms

One must not forget the drive-in theatres. Their problem is of serviceability and the ability to be seen at night. Usually the change-makers have vivid colored uniforms, while the car-parking attendants either use an overall or jumper type uniform which can be made in an attractive combination of colors. Fabrics can either be dry-cleaned or laundered. For unexpected showers, raincoats with broad yellow horizontal stripes of rubber or bands of irridescent tape, easily recognizeable, are becoming more and more popular with drive-in managements as a protective means for their employees on nights when the weather cuts down visibility.

Attractive Uniforms Exploitable

Statistical research cannot prove that any theatre has been rewarded with a tremendous increase in receipts when its attendants don uniforms, but it does make a difference. One of the most amazing factors is that showmen, and very often theatre owners are that in the fullest sense of the word, fail to take advantage of one of their most important display media. They avail themselves of all the advertising and publicity at their disposal, yet they seemingly ignore the tremendous display possibilities in attractive uniforms.

If you operated a chain store, one of the first pre-requisites would be that your shelves display attractively wrapped packages, to make your customers have an eye "consciousness" which stimulates sales. This packaging principle should certainly apply to uniforms. The manager cannot be expected to greet all the patrons personally. Therefore, the cashier, ticket taker, and ushers must also act as the personal representatives of the management, and as such they must create an attractive appearance in their dress.

Uniforms are worn by the military and organizations of all types, for the simple reason that they lend a unifying note and give to each member of the group a sense of personal responsibility in the over-all functioning of an efficient team. It makes the individual feel that he is more than just another face in the crowd, but an important part of the over-all scheme of things. This applies to theatre staffs, as well as it does to any other organized group of individuals.

Uniform Maintenance

Correct maintenance of uniforms is something that must be preached to both the manager and his staff. There are two things that can deteriorate uniforms more rapidly than anything else. One is to place uniforms in musty lockers

when wet with perspiration. The other, is when cleaners press and return the uniforms after their cleaning process while still damp. The chemicals used in cheap cleaning often contain such a strong bleach or alkali that unless the uniform is properly dried, pressing destroys the fibers in the fabic and causes cracking. All uniforms should be cleaned and pressed at least twice monthly, and sent once a year to the manufacturer for a complete reconditioning. Only uniform manufacturers have the proper facilities to rebraid the uniforms correctly.

The expense of manufacturers in-plant reconditioning ranges from three dollars to eight and one-half dollars, depending upon the quantity of buttons that must be replaced, braid removed and replaced, frayed cuffs, collars to be replaced, and whether the bottoms of the trousers and the sleeves must be refaced. But such repair, which the average local tailor is not adequately equipped to handle, increases the life of the garments from eight to 16 months.

Comfortable Approach Reached

The day of the super type metropolitan theatre which had both day and night uniforms, usually consisting of gobs of gold lace, silver bullion trimmings, stiff collars and ties is about over. A more comfortable approach has now been reached. The average theatre has a more subdued practical uniform, suitable for all day wear. In a few remaining plush theatres the ticket takers, and inside doormen still wear the full dress suit with tails, all others lean towards a double breasted coat.

Ushers in both deluxe houses, small city or suburban theatres, today are all using the sack coat with as little trimming as possible — mere braid on the collars, sleeves, and down the trousers will suffice. Avoid making a Radio City Music Hall attendant when your staff does not comprise more than a dozen men.



MOST THEATRES dress their ticket-takers in a neat, but fairly simple double breasted jacket as seen here.

Porters usually have a functional uniform either a sack coat to match the fabric and color schemes worn by the ushers and doormen, especially if they are assigned to lobby work. Many large circuits prefer the blouse or jumper style jacket in place of the coat. These are trimmed the same as the other uniforms.

Resort Theatres

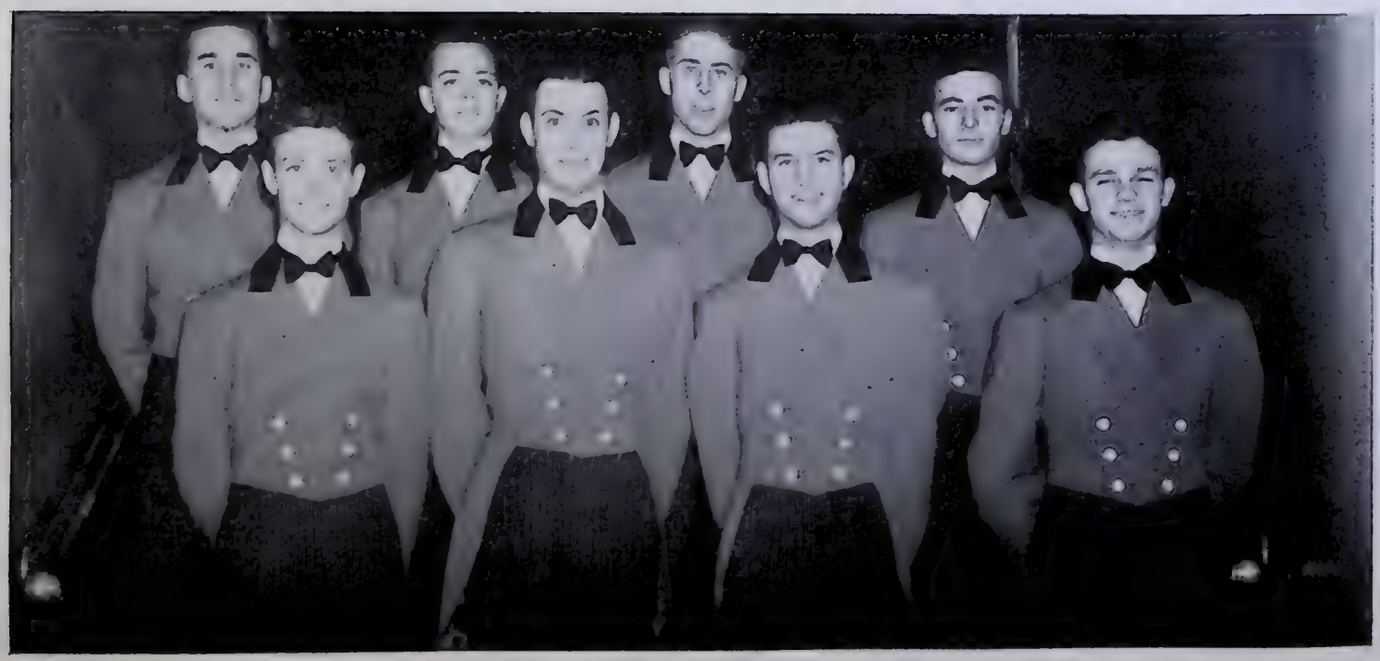
Resort theatres must emphasize conservative smartness plus attractive coolness in their uniforms. This class of patronage demands smartness with a not too formal air. Usually resort theatres adopt a uniform using a light shade of fabric, such as white, French blue, or gray for the coat, with the trousers of another color, giving the ensemble a two-tone effect. This type of uniform usually uses little braid, and gets the desired effect by contrasting colors. Very often the ushers or usherettes are outfitted in inexpensive, smart white or colored trim gabardine mess jackets with collars and cuffs of contrasting material. With this type of mess jacket, either cummerbund sashes, or vesties corresponding to the trim on the collars are usually worn.

Today the most popular fabrics are 100 per cent wool, two ply woolens in both serges and light weight tropical. Broadcloths and whipcords have practically disappeared from the scene. Gabardines of an all wool texture and man-made synthetic blends are coming in very strongly. However, as to the rayon, and nylons, the dacron and wool blends, they are too new to determine what their exact role in the manufacturer of theatre uniforms will be.

CONCLUSION

With money being spent for wide screens and stereophonic sound, and other new projection and sound systems, it seems that this is the right time for smart and attractive uniforms to share in theatre modernizing plans. Show your patrons your faith in the motion picture industry, and include in your plans properly attired attendants who contribute to the appeal of your theatre.

ALTHOUGH THE trend is away from such uniforms today, there are still a few deluxe houses which like to have the air of luxury and dignity that is derived from the wearing of full-dress tail type coats. This photo shows the deluxe uniforms worn by doormen of Miller Theatre, Augusta, Ga.



Theatre Air Conditioning

A Review of Basic Air Conditioning Systems and A Summary of the Latest Advances Made in Equipment

By R. D. McLain
Manager, Central Packaged Div., United States Air Conditioning Corp.

Air conditioning has long been established as a basic ingredient of the successful theatre operation, dating from the early history of comfort cooling when theatres were its principal users.

The problem, then, is not whether to air condition but how to air condition.

BRIEF: ***The past few years have seen tremendous strides made in the general field of air conditioning . . . In this overall improvement of equipment and methods . . . it is only natural that the systems designed for use in motion picture theatres should also be increased in efficiency.***

The purpose of this article is to furnish the reader with a refresher course on basic theatre air conditioning requirements . . . and a report on the improvements that have been made . . . There are sections devoted to tips on the selection of basic air conditioning equipment . . . what can be expected from the various systems . . . and how to get the greatest degree of efficiency from the cooling equipment . . . There is also an interesting and practical example of how these principles have been applied to an actual theatre installation.

What the System Should Accomplish

Certain goals of the air conditioning system should be established before selection of specific equipment to do the job.

1. The principal function of the air conditioning system, of course, is to maintain comfortable conditions throughout the theatre regardless of weather and occupancy. To be satisfactory, a system must maintain a 70-80 degree temperature and relative humidity no greater than 55 per cent. These conditions should prevail uniformly through the theatre — the front of the orchestra should not be cooler than the rear of the balcony.

2. For maximum comfort, air should be moved gently from the front to the rear of the theatre, preferably about four feet above the floor level. Enough separate supply air sources and air returns must be provided to prevent excessive air movement. Supply air should total 15 to 25 cubic feet per minute per occupant.

3. Enough fresh air should be provided to eliminate odors and enough air must be exhausted to remove smoke, if smoking is permitted. No less than six cfm of outside air per occupant should be introduced, and more should be provided where smoke or other conditions require it. Provision should also be made for use of 100 per cent outside air in moderate weather. This will reduce operating costs and provide entirely satisfactory comfort conditions.

4. The noise level of the operating air conditioning machinery should be low enough not to disturb theatre patrons. Where placement or characteristics of the equipment so dictate, soundproofing treatment should be employed.

5. Controls should be simple and automatic, maintaining design conditions under all circumstances of weather and occupancy. It is particularly important that overcooling and excessive humidity be avoided.

Air Distribution Systems

The actual system to be adopted will, of course, be determined by the physical character of the individual theatre. The shape and size of the building, seating capacity, ceiling height and balcony arrangement will influence the choice of equipment and the air distribution system. In any event, an architect or consulting engineer should be consulted to ascertain the most effective and economical means for attaining the desired objectives.

Four basic systems are used to distribute air in theatres: **overhead, front, rear and side diffusion.**

In the overhead system, a single supply duct is ordinarily run through the attic area with a series of diffusers distributing air from the ceiling. Where there are balconies, branch ducts lead to diffusers serving the areas under the balconies. Return air is taken through the floor or at a low level. With this



THIS 100 TON usAIRco evaporative condenser recirculates up to 95 per cent of condensing water in the Strand Theatre, Albany, New York.



A 30 TON preassembled central station RK unit (above) being inspected at Ritz, Albany, N. Y. Ductwork in theatre (below) is being insulated.

system, a continuous flow of cool air moves vertically toward the floor.

With the front distribution arrangement, supply air is discharged high on the front walls on both sides of the proscenium. The air moves slowly over the audience to the return air grilles low at the rear.

The rear system uses high velocity air discharge at a high level, which, moving along the ceiling to the front, creates a rearward air movement at the floor level. Return air is also taken at the rear in this circular air flow system.

The sidewall system can utilize diffusers on either one or both side walls, depending upon the size of the theatre. In the latter instance, particular care must be exercised to avoid excessive turbulence at the center of the theatre which will occur if the two air supplies overlap.

Selection of Basic Equipment

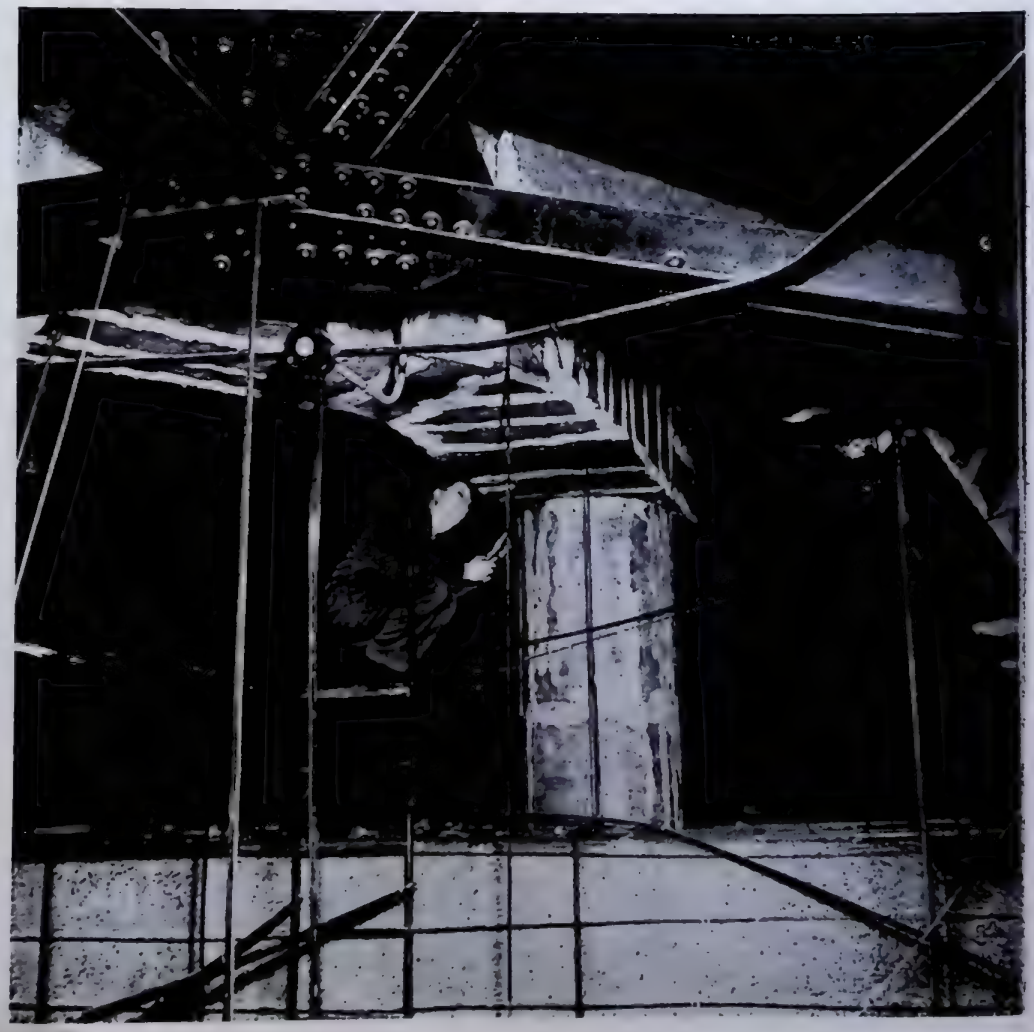
The air conditioning industry offers a wide variety of equipment to meet the many different requirements of theatres. Available refrigeration air conditioning plants vary from packaged air conditioners, which can be placed directly in the conditioned area, to complex built-up systems, occupying extensive equipment rooms and utilizing such devices as air washers, reheat coils and humidifiers to provide critical and continuous control of all atmospheric conditions.

In the simplest cases, packaged units, which are available in 2 to 15 ton sizes (one ton of cooling is the equivalent of 12,000 B. T. U.'s per hour of cooling capacity), can perform adequately. These units are often located in the main theatre area and contain, in attractive upright cabinets, complete refrigeration systems and blowers for air distribution. They require only connections to supply water and drain and to an electrical power source. They can be used with duct systems if a remote location is desired. Most packaged units can be equipped with heating coils for all-year operation.

Most commonly used is the central refrigeration air conditioning plant. This can be built up on the job from separate components (compressor, coil, air handling equipment, condenser, etc.) or can be obtained in compact factory-assembled units such as usAIRco "Refrigerated Kooler-aire," which contains all of these elements, including evaporative condenser if desired, in a single casing.

The latter units, available in 3 to 60 ton models and usable in combinations for larger capacity, reduce on site-labor and eliminate extensive refrigerant and water piping runs. A 10-ton RK unit occupies only 25 square feet of floor space and a 60-ton model takes only 97 square feet. These units are installed with only three connections — to ducts, water supply and drain, and power supply. They can also be equipped with heating coils for all-weather use.

In instances where cold well water is available, this can be used as a cooling medium, eliminating the need for mechanical refrigeration machinery. This water can be utilized either to supply an air washer, a cooling coil or a unit air conditioner (coil and fan unit).



Most air conditioning systems over 1 ton in capacity require large quantities of water for use in condensing the hot refrigerant gas in the air conditioning plant. If water is plentiful locally, this condensing water can be wasted to the drain. However, where cost or local restrictions on water use preclude this, evaporative condensers and cooling towers are available which recirculate as much as 95 per cent of it.

In the evaporative condenser, water passes over coils through which the hot refrigerant gas is flowing and air is blown upward counter to the flow of the water. A small quantity of the water will be evaporated, extracting heat from the gas. The water not evaporated is recirculated and used again.

This equipment must be located close to the main plant to minimize refrigerant piping runs. In factory-assembled equipment, such as the usAIRco RK, described above, the evaporative condenser is an integral part of the plant. usAIRco Refrigerated Kooler-aire units are also available with water-cooled condensers which can be used where water is plentiful or in conjunction with a cooling tower as next described.

The cooling tower is used in place of the evaporative condenser when (1) there is a problem of disposing of the hot air from the latter, or (2) there are several condensing units. In cooling tower systems, cool water, rather than evaporating water, is passed over the condensing coils to remove heat from the refrigerant gas. After it has accomplished its purpose, the now warm water is pumped to the top of the cooling tower and sprayed or dripped through an air stream. A small portion of the water evaporates, cooling the rest, which is then ready for another condensing cycle. Again, the only make-up water is that which evaporates. The cooling tower must be placed outside the building.

Location of Equipment and Ductwork

From the standpoint of economy and operational efficiency, the location of the equipment should be selected to minimize the length of supply and return ducts. As previously mentioned, it is also important that operating noise from the equipment not be audible in the main theatre area.

Where supply ducts carrying cool air are exposed to high temperatures, a condition that is particularly serious in attic spaces, the desirability of duct insulation should be investigated.

An Example

Striking evidence of the advances in modern theatre design is provided by the new air conditioned Terrace Theatre, recently completed at a cost of almost $1,000,000 as the major attraction in a suburban shopping center in Robbinsdale, Minnesota. (See 1952 THEATRE CATALOG, page 36.)

The theatre, on the top of a hill commanding dramatic views of Lake Crystal, in the "Land O'Lakes" section of suburban Minneapolis, was erected by William and Sidney Volk, from plans by Liebenberg and Kaplan, architects and engineers, featuring a year-round air conditioning system utilizing United States Air Conditioning Corporation equipment and 52 degree well water.

The theatre is set back several hundred feet from the two nearby traffic arteries, but passersby are attracted by roadside stone pylons and a huge pylon of brick and glass on the building itself. Its corner entranceway emphasizes twelve all-glass doors in two banks, leading to the lobby. A highlight of the foyer is an unusual copper "wishing well" drinking fountain.

Directly off the lobby, a luxurious sunken lounge is rimmed off by a low stone wall that encloses a tier of cushioned seats. The lounge features a copper-hooded fireplace and an array of colorful plant boxes. A dramatic blending of inside and outside treatment is achieved by the liberal use of cut stone, redwood and oak in the interior and by slanting window walls which provide



TERRACE Theatre, Robbinsdale, Minn., is cooled through circular ceiling diffusers and the return grilles can be seen in the rear ceiling.

a glareless view of the surrounding countryside.

The main theatre area accommodates 1,300 people, and has been designed to provide extra space between seats and in the aisles. The main floor and stadium-type mezzanine face of screen mounted in a picture frame, without a proscenium arch. A semi-circular stage, in front of the screen, is approached by carpeted steps, segmented by cut stone planter boxes.

Other unusual features are a sunken television lounge, soft drink bar, and, above the upper seating level, two glass-enclosed, soundproofed "cry rooms," each equipped with play pens, cribs and bottle warmers. These "cry rooms" are provided for the convenience of parents with small children, permitting them to view the picture and hear the sound from special speakers without having the children disturb other theatre patrons.

The air conditioning system was designed by Liebenberg and Kaplan and installed by Spencer Air Conditioning Company, contractor. For cooling and ventilating, 100 per cent fresh air is washed by 220 gallons per minute of 52 degree deep well water, in a usAIRco D51 air washer. Up to 53,000 cfm of the cooled air is circulated through ceiling diffusers in the auditorium, cry rooms, foyer, lobby, lounge and TV room, by a 54 inch double inlet fan. This supply air fan is equipped with a hydraulically controlled variable speed drive to provide variable volumes of supply air under easy, ready control of the operator of the system. This will enable him to meet the requirements of variable weather conditions, particularly in the spring and fall, and of varying sizes of the theatre audience. A lower volume of air is used during the heating season and full volume is used for quick pickup before theatre opening time.

Air is exhaused through two large vents of special design at the ceiling near the rear wall of the balcony and two grilles flanking the rear row of the center balcony, in addition to the exhaust through open lobby doors. Further mechanical exhaust is provided for the projection booth, rest rooms and offices.

For heating and ventilating, usAIRco steam distributing type coils, supplied with low pressure steam from an oil fired boiler are employed in the main system with booster coils in the ducts supplying the foyer, lounges, rest rooms and TV room. A bank of standard filters is also utilized during the heating season.

A blanket of warm air at the inside of the entrance doors is provided by special built-up units, with air distribution through double deflection usAIRco ceiling "Deflecto-Grilles." Return air is picked up at the floor line adjacent to the doors.

The control system employs an "economizer" control which does not permit the introduction of fresh air until the building has been brought up to temperature. Zone control has been provided for the auditorium, lounge and foyer with additional zoning provided on concealed fin radiation in the lounge and in the foyer.

The building has a full basement under the auditorium in which six unit heaters were placed to maintain comfortable floor conditions during the heating season.

CONCLUSION

In closing, the importance of consultation with an air conditioning expert must be repeated. An improperly planned system is a burden on the theatre operator in cost, inconvenience and loss of good will. Qualified advice is available from engineers, contractors with trained engineering departments and from equipment manufacturers.

IMPRESSIVE EXTERIOR of the Terrace. The theatre uses well-water as cooling medium for air conditioning system in its 1300 seat capacity. In the ever-increasing struggle for the entertainment dollar it is of prime importance that fine theatres provide proper air conditioning, with the other vital extras.



Keep Theatre Air Clean

Electronic Cleaning of Air in a Theatre, Can Mean Increased Patronage and Reduced Maintenance Costs

It is fairly safe to say that at the present time the average person is more conscious of air conditioning and air cleaning than at any other time in history. With more and more private homes and apartments being equipped with home air conditioning units Mr. and Mrs. Average Citizen is learning to enjoy and expect an atmosphere that is free of annoying heat or humidity, and also free of dirt and foreign particles.

One of the ways of providing a theatre with clean, pure air, with dust, dirt, smoke, lint, pollen and other irritants removed, is the electronic air cleaner manufactured by Trion, Inc.

The air cleaner can be easily installed into the return air duct of a warm air heating, air conditioning, or ventilating system. The principle involved is that of electrostatic precipitation. All particles, even of sub-microscopic size, are electrically charged as they pass through the high voltage ionizing screen. These particles are then attracted and adhere to the collecting plates as a piece of metal is attracted by a magnet. Periodically, depending on the dirt content of the air in the particular locality, the dirt is washed from the plates by the integrally constructed water wash system, and is flushed into the sewer. With the removal of foreign particles only pure, clean air is left to be circulated through the building.

Equuipment

There are three major component parts to the electronic air cleaner; the ionizing-collecting cell, the power pack and the water wash spray system.

1. The Ionizing-Collecting Cell consists of fine tungsten wires which are suspended in front of and between a series of parallel aluminum plates on which the foreign particles from the air are collected.

2. A Power Pack, with transformers and rectifier tubes for supplying high voltage direct current to the Ionizing-Collecting Cell.

3. A Water Wash Spray System for automatically washing the dirt from the aluminum collecting plates.

The framework and cabinets are sturdily constructed of corrosion-resistant heavy sheet steel. The cell-construction is aluminum. Since there are no moving parts, there is nothing to wear out. The power pack, which supplies the necessary current to the unit, contains two rectifier tubes which have the life span of any ordinary radio or television tube. The power pack on the Trion filter is so designed that it can be easily replaced with a factory rebuilt unit if necessary.

The detailed type and size of an electrostatic filter for any given application depends entirely upon the efficiency requirements. For ordinary ventilating purposes the removal of 90 per cent of all air-borne dust is considered practical. When installed in accordance with specifications, and not in excess of nominal rating, the electronic air cleaner is guaranteed to remove more than 90 per cent of particulate matter from air streams — as determined by the National Bureau of Standards Dust-Spot Test under normal atmospheric conditions.

Operation and Maintenance

Trion equipment of a size capable of cleaning the air of a theatre may be floor mounted or suspended, depending

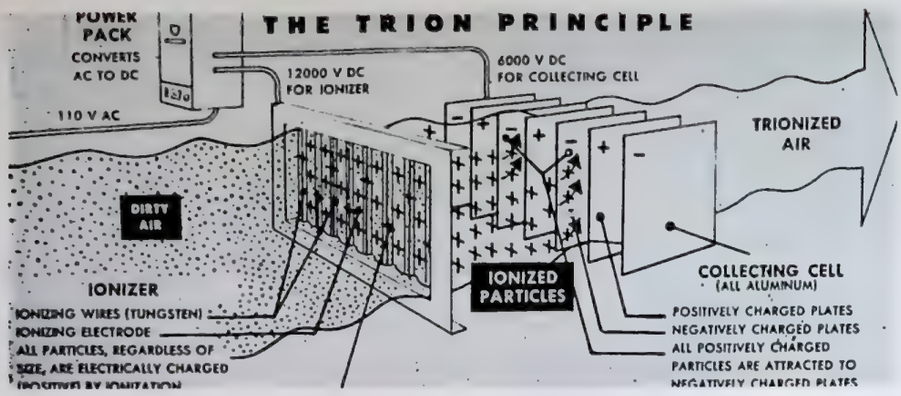
---

BRIEF: ***The operation of a theatre today requires more than just getting good product . . . and presenting it on a good screen with good projection and sound equipment . . . The public has come to expect this from their theatres . . . They have also come to expect extra services and benefits that make going to the movies a pleasing and pleasant experience . . . One of the things which comes under this heading is properly cooled and cleaned air.***

This article discusses a method of electronically ridding the air of dirt and pollen . . . and smoke particles in a simple inexpensive manner . . . This system will also cut down cleaning costs . . . and wall fabrics and draperies will last much longer . . . There is also a section devoted to an actual theatre installation of this air cleaning method . . . and the interesting results.



LARGE GRILLES TO THE RIGHT OF THE stage of the Gateway, in Fort Lauderdale, Florida, carry the stale and dirty air to the Trion unit where it is purified and returned mountain fresh through circular ceiling diffusers in the theatre.



ABOVE IS A SCHEMATIC sketch of the Trion principle used in purifying of stale and dirty air.

upon the particular application. There is practically no maintenance required as the larger models are cleaned by turning a valve on the exterior of the ductwork. The water wash manifold is so engineered that all collecting cells are effectively cleaned. Hot water at 125 degreesF., is recommended for washing.

The cost of operation of the smaller units is about three cents a day, with comparable costs for more elaborate installations. It is claimed that with an electronic air cleaner, walls, ceilings, and draperies will remain fresh for long periods of time. The savings in cleaning and maintenance bills is said to make the system pay for itself in a fairly short period of time.

Another important advantage, in addition to the savings in maintenance and cleaning costs, is the healthful benefits of clean air. The elimination of pollen from the air provides complete relief to sufferers of rose fever, hay fever and the like. Sterile air with bacteria removed, reduces the chance of spread of colds and other respiratory diseases. This is particularly important in theatres where large groups of people sit in close proximity to each other. Better lighting of lounges, lobbies, rest rooms, etc., is another advantage of providing clean air. The dirt and grime which are attracted to lights and lighting fixtures can be greatly reduced by clean air. Often times, the efficiency of a dirty light or fixture will be reduced by as much as 40 per cent.

Air Pollution Problem

Some idea of the amount of dust, smoke, soot, and dirt in the air may be gained by investigations which show that the resident of an average industrial city takes into his lungs each day, at least a teaspoonful of dirt. There is a great cloud of dirt continuously suspended in the atmosphere of industrial areas. In an article concerning the air contamination of an average industrial city, "Fortune Magazine" states: "If gathered in a single pile, it would create a slopping mountain 1500 feet high, or split equally over the average city, it would bury the city 21 feet deep."

THEATRE APPLICATION

One theatre which has installed electronic air cleaners with satisfactory results, is the 1500 seat Gateway, Fort Lauderdale, Florida, (see 1952 Theatre Catalog, page 80). One of the finest houses in the Wometco Theatre Circuit, the Gateway is completely modern and up-to-date in its operation. Included among some of the features are a soundproof cry room complete with cribs and play pens for the youngsters, and a television lounge with rocking chair seats, where free coffee is served at all times. One of the most popular "extras" is the completely clean air.

Patrons who suffer from airborne allergies such as hay fever and asthma receive relief from their wheezes and sneezes. This is accomplished due to the fact that the airborne pollens which cause most allergies range in size from 1/500 to 1/1200 of an inch. The air cleaners at the theatre effectively remove particles from the air as small as 1/250,000 of an inch.

Permission to smoke while relaxing and being entertained is another of the many inducements made possible. A smoking lounge was provided, and it became so popular that an additional charge is now made for the added benefit. The cigarette smoke causes no discomfort for non-smokers or others in the theatre. The smoke particles are carried away through ventilators and ducts to the electronic cleaners where they are collected.

Clean air has been responsible for the theatre's extremely low maintenance costs. Pastel walls have remained like new since the theatre was constructed, and should remain so for years according to the resident manager. Seats, draperies, and other furnishings have not been soiled by airborne dirt. Because there is less cleaning of all furnishings, depreciation has been greatly reduced, and less cleaning personnel is necessary. In addition, expensive projection equipment is protected from dirt and dust which decreases efficiency and requires more frequent inspection and cleaning.

The Trion principle for providing clean air is one of the most efficient that has been devised. Air from the outside atmosphere is combined with recirculated air from within the theatre. Upon entering, the air carrying all the harmful and annoying particles, passes through an electrostatic field, and each particle receives a positive electrical charge from fine tungsten wires carrying 13,000 volts direct current. The positively charged particles are then attracted and adhere to negative collector plates. At periodic intervals, from one to four times a month, the built-in water spray system washes all collected matter from the plates. The clean air then passes through cooling coils, and is expelled through diffusers to all parts of the theatre.

The filters require very little space and the cost of operation at the Gateway is approximately five cents a day. According to the manufacturer, the equipment at this theatre will pay for itself, based on savings in cleaning and redecorating costs, increased patronage, and protection of equipment, within four years or less.

VIEW OF THE AIR ENTRANCE of the Trion equipment installed at the Gateway Theatre.



Theatre Fire Protection

The Vital Task of Knowing What to Do in Case of Fire and the Equipment Needed Is Outlined

BRIEF: ***One of the theatre operator's most vital responsibilities is to give his patrons as much protection against fire as is humanly possible . . . In order to do this properly . . . the exhibitor must be thoroughly acquainted with the most common types of fires . . . and the most common causes of these fires . . . particularly in theatres . . . This article attempts to furnish some of this information.***

In addition to knowing the types of fires that are possible . . . it is . . . of course . . . just as important to know how to combat these blazes before they get out of hand and cause serious damage . . . and possible loss of life and property . . . Here again . . . the author attempts to make the reader more familiar with the proper methods.

There are also valuable sections devoted to training employees so they know what to do to prevent fires . . . and how to react when a fire does occur . . . Throughout the article there will be found mention of equipment best suited to handle theatre fires before they reach the point where the Fire Department is needed . . . or at least capable of keeping things under control until more help arrives.

By WALTER E. MORGAN
Industrial Dept. Manager, Walter Kidde & Co., Inc.

Theatre owners realize that protection of a theatre audience against injury or death, directly or indirectly the result of fire, is one of their vital responsibilities. While the large investment represented in a modern theatre influences interest in fire safety, audience protection remains the major consideration.

In the theatre of today, the danger of fire itself is frequently secondary to the panic which it would cause. As a result, the approach to theatre fire safety takes two directions. The first is the elimination of materials and conditions encouraging to fire. The second concerns methods of fire fighting which are positive in effect yet will cause a minimum of nerve-disturbing noise or odor upon use.

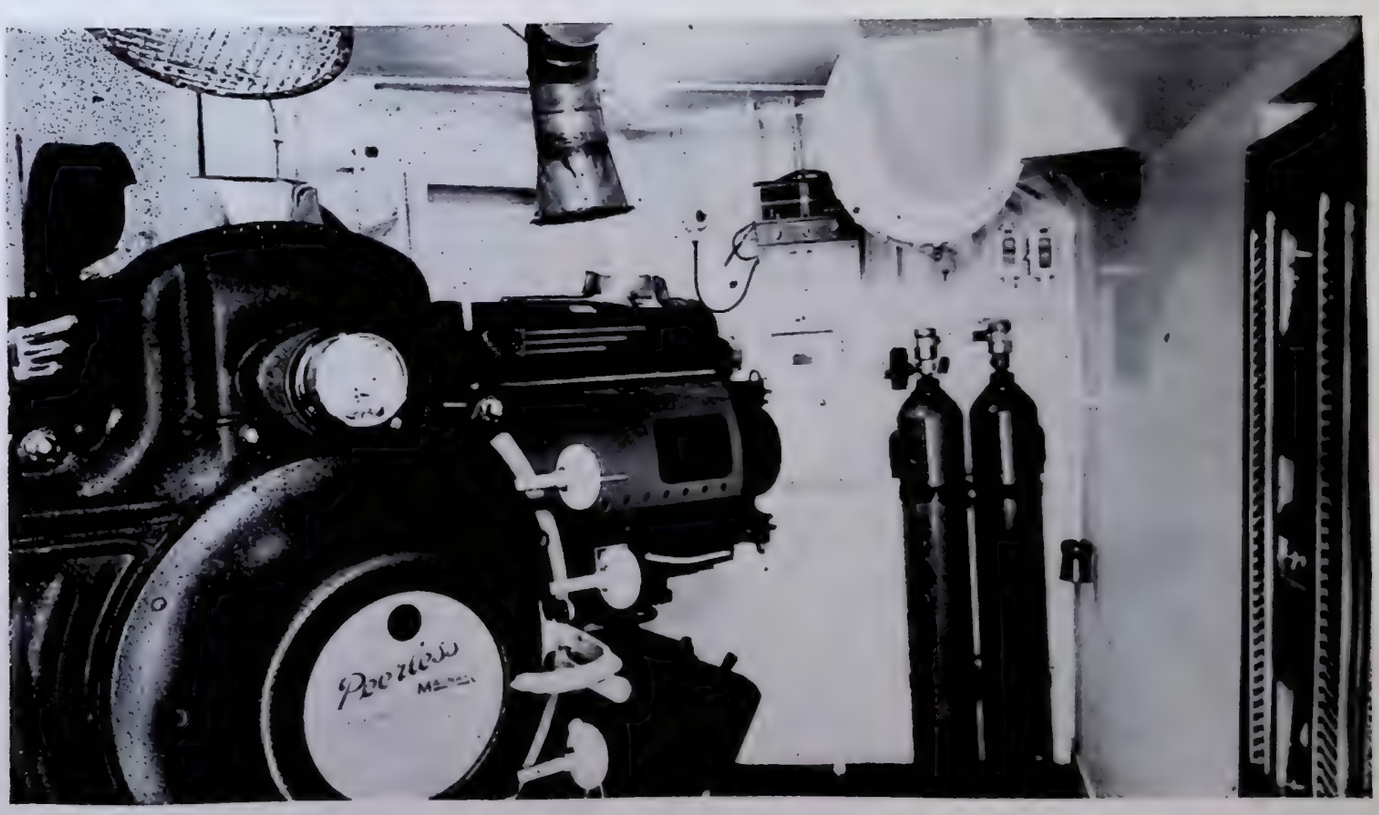
WHAT IS FIRE?

First, let's understand what fire is, how it is classified, and the extinguishing agents best suited to combat each. Three elements must be present for fire to exist: a combustible material, heat, and oxygen. Remove the combustible material or materially reduce either of the other two and you cannot have a fire. Normally, it is impossible to remove combustible material after fire flashes so the usual method for fire fighting is to reduce heat or oxygen.

There are three classes of fires and specific agents are recommended to combat each type most effectively. Class A Fires occur in ordinary combustible materials and are best extinguished with water because of its quenching and cooling effect. Class B Fires occur in flammable liquids such as gasoline, paint, or naphtha and require smothering rather than quenching. They should be attacked with carbon dioxide, dry chemical, foam, or vaporizing liquid. Class C Fires flash in electrical equipment and require an extinguishing agent which is a non conductor of electricity. Carbon dioxide, dry chemical, or a vaporizing liquid fit this bill.

Fire Retardant Construction

The great majority of theatres today are built keeping flammable materials at a minimum. From the cellar to the roof, fire resistant or retardant building and decorative elements are employed whenever possible. Credit for these fire-safety advances belongs to the combined efforts of insurance underwriters, decorator-designers, city and state fire commissions, and industry safety groups.



A CARBON DIOXIDE system installed in the projection booth of an ocean-going liner where it is imperative that fire hazards be controlled.



IN PLACES frequented by the public, equipment such as this water extinguisher is necessary.

Until recent years it was difficult to create an attractive theatre interior in keeping with the "Palace" taste of the past without using festoons of flammable fabrics combined with woods and paints. The situation is vastly different today with simplicity the interior theme and the availability of handsome, moderately-priced, flame-resistant fabrics and decorative materials.

Keep the Theatre Clean

Good housekeeping throughout the theatre is vital. This means that flammable debris on the floor must not be permitted to accumulate and paper towels, basement refuse, and the like should be promptly disposed of. Further, combustible cleaning agents, paint, and other service and maintenance materials should be stowed orderly in a space removed from an ignition source and preferably in an enclosed, fire-resistant room.

Make every effort to reduce the accumulation of flammable elements, particularly in remote, unattended areas. If there are no flammable materials about, you can't have a fire!

The Problem of Smoking

Anyone who has observed the public's smoking habits in theatres knows that smoking presents a severe problem for theatre owners. It is anyone's guess when, or on what a cigarette will be thoughtlessly dropped.

You're lucky if your theatre is in a community that bans smoking in places of public assembly. However, if you're located in a "can smoke" city, limit it to areas that can be closely supervised, and equipped with fire retardant materials and portable extinguishers.



IT IS important to have the proper type of extinguishers. This is 2½ gallon soda-acid type.

IF FIRE COMES

In spite of all reasonable precautions, occasionally fires do start. Be sure you have fire-fighting equipment available to extinguish them efficiently and with a minimum of panic-creating noise or odor.

Provide water standpipes with attendant hoses and nozzles in sufficient quantity to cover any section of your theatre. The hose should be ispected for wear or rot at least every six months and replaced as necessary. All of the standpipe connections should fit hoses used by your municipal fire department. These will probably prove to be two and one-half inch couplings. However, the hose attached to a hydrant or standpine can give a terrific "kick" if turned on suddenly. As a result many theatres have provided easily removed adapters for standpipes. These adapters employ one and one-half inch hose which is decidedly easier and safer to use. At the same time the water outlets can be used with two and one-half inch municipal fire hose.

Portable extinguishers should be placed strategically for first aid fire fighting. In purchasing this equipment and planning its location, particular thought should be given to the type and size of fire each one is most likely to be required to combat.

In spaces frequented by the public such as the lobby, auditorium, and lounges, probably only Class A fires will be encountered. Therefore, for first aid fire fighting, a water-type extinguisher such as two and one-half gallon units should be provided. This type of portable supplies a forced stream of water pressured by carbon dioxide. It is quiet in operation and has no odor or toxic fumes.

For spaces containing electrical or mechanical equipment, carbon dioxide or dry chemical will prove most successful. While neither of these agents conduct electricity, thought should be given to possible damage to equipment sprayed by the agent. Carbon dioxide, an inert gas, cannot harm equipment and as it eventually dissipates into the atmosphere, leaves no mess to be cleaned up following the blaze. On the other hand, dry chemical, an excellent fire killer, consists of fine granular particles expelled under pressure. It does leave a residue and equipment like electrical motors will require cleaning afterward.

The importance of choosing the proper *type* of extinguisher for the *kind* of fire cannot be over emphasized. Remember, a water stream will only spread burning liquid and as it conducts electricity, its use on electrical equipment employing high voltage flirts with the possibility of electrocution.

So that no mistakes are made, all portable extinguishers should be labeled clearly with "how to use" and "on what" tags. Such labels are furnished free by Walter Kidde & Company, Inc. of Belleville, N. J.

Be sure that all of your employees will report a fire before making any attempt to combat it themselves. There are obvious exceptions to this rule, of course, but fire records show that annually too many buildings burn to the ground because the fire was not reported promptly. By the time the untrained fire fighters realized that they could not cope with the blaze and turned in a municipal alarm, it was too late. The fire was out-of-hand.

Employee Training

No fire fighting equipment is any better than the people available to operate it. If fire comes, who wants to stop to read operational instructions while the fire grows? So — give your employees a short lecture on the kinds of fires which could occur in your theatre and explain how the available fire-fighting equipment can be used most advantageously against each.



A BUILT-IN carbon dioxide system for the protection of an electrical panel board is seen.

Then out-of-doors, present a short fire fighting demonstration. Set small paper and gasoline pan fires. Then extinguish them with the portables. Give every employee a chance to handle the equipment and use it on the small fires.

The training will pay off. Not only will your personnel react properly and quickly to a real fire emergency, but they will have confidence in the extinguishers and, best of all, their ability to handle them.

It goes without saying that every theatre employee must receive training in "emergency audience exodus" procedures. Don't forget, panic thrives on confusion. If your employees work calmly and quickly during an emergency, you will have gone a long way toward avoiding panic and performing the audience removal job efficiently and in the shortest possible time.

Most city fire departments are most anxious to cooperate in training programs and many will completely take over the demonstration for you. Call on them; they may supply some helpful tips.

A Thorough Pre-closing Inspection

A leading movie theatre operator reports that one of the most vital parts of his fire-safety routine is a complete inspection of every part of the theatre prior to locking up for the night. Over a period of almost twenty years, these checks have revealed several small fires which were extinguished promptly. Further, these checks frequently disclosed potentially dangerous situations. This operator states that "while it is anyone's guess just what the fire damage would have been had they not been discovered prior to closing, the pre-closing inspection policy has saved me thousands of dollars in property damage and, perhaps even more important, kept my boxoffices open for business."

The Projection Booth

Fire protection for the projection booth has been a matter for debate for years. Becasue some film burns fiercely and almost defies measures to put it out, one leading movie chain requires booth personnel to vacate the space immediately in case of fire. They count on the fire resistant construction of the booth to prevent the spread of fire while it burns itself out. They also feel that with present day film storage and modern projectors, the chances of a large volume of film flashing is most unlikely.

This theory also is employed by one of the country's largest passenger steamship companies. In several of their new ships, similar instructions are issued to theatre projection booth personnel. However, the operating company installed a manually-operated, built-in carbon-dioxide fire extinguisher for each booth. In case of fire, the operator immediately leaves the space. The exit door closes automatically behind him; and by means of a pull box mounted on a bulkhead next to the exit, he trips cylinders of pressurized carbon dioxide. The released liquid rushes from its cylinders, through piping, and is discharged into the booth as a gas from Multijet nozzles. By reducing oxygen in the room to a point which will not support combustion (except for the most violent film fires), the flame is smothered. In this installation, passage of the extinguishing agent through the piping throws switches which shut off ventilation for the space, secure all electrical equipment within the booth, and cause alarms to sound in a central fire station(s).

No matter what your projection booth fire policy may be, equip your booth with carbon dioxide portables. Remember, they can be used on electrical equipment or machinery fires equally well and will not damage the valuable equipment.

Electrical Control Board Protection

Another thought for large theatre owners comes from a well-known steel company. It uses built-in carbon dioxide systems to safeguard its vital electrical control boards. These systems are automatically set-off (they also have pull boxes for manual release) and could be used for similar vital and costly switch boards in theatres. Except for the addition of the automatic feature, they function in the same manner as the carbon dioxide systems installed in the ships' projection booths. In the case of a theatre, the installation could be made so that the alarm would be flashed to municipal fire headquarters as well.

Fire Detection

Nearly every theatre has at least one space which is unattended and infrequently entered containing valuable equipment or supplies. Such spaces might be the air conditioning apparatus room, boiler room, dressing rooms, or storage spaces. For example, a fire breaking out in the electrically-powered and controlled air conditioning equipment could rage unnoticed for some time and do extensive damage to the equipment before being detected.

Kidde has installed scores of fire detection systems to protect this type of space. Some of them work in conjunction with automatic extinguishing systems. They comprise heat sensitive elements placed throughout the hazard space. Some react to a continuing rate-of-temperature rise while others actuate only when a fixed temperature has been reached. If fire flashes, the elements cause alarms to sound in one or more locations, and switches can be included in the systems to secure machinery, lights, ventilation, etc.

The Fire Trap Next Door

You may have the best fire safety program in movie theatre operation, but if your theatre is surrounded by poorly-protected, highly-flammable buildings, your building is jeopardized. Consider cooperating with the owners of adjoining structures in a joint fire safety campaign. You may find the owners of these buildings unaware of their buildings' shortcomings and most anxious to work with you in improving the general situation.

If this proves unsatisfactory, some theatre owners have found it economical to install roof-top water sprinklers, water curtain equipment for side walls, and fire walls.

No matter what your situation is, don't feel secure because your own building is adequately protected. Your good neighbor may prove to be bad.

CONCLUSION

Great strides have been made in theatre fire safety over the years. In the long run, however, safety codes can do only so much. The big job lies with the individual owner taking steps to provide his own theatre with procedures, equipment, and fire extinguishing apparatus that feature "No Fire Today."



FIVE POUND CARBON DIOXIDE EXTINGUISHER



10 POUND CARBON DIOXIDE EXTINGUISHER



FIVE POUND DRY CHEMICAL EXTINGUISHER



20 POUND DRY CHEMICAL EXTINGUISHER

Furniture Rests Can Save Floors

The Use of Simple and Inexpensive Furniture Rests in Theatres Can Sharply Reduce Repairs and Replacement of Floor Coverings

BRIEF: *It is the attention given to seemingly small details that can often spell the difference between the success or failure of any business enterprise . . . and the motion picture theatre is certainly no exception to this thought.*

This article is devoted to a study of the various types of furniture rests which may be used on lounge furniture . . . and other items which may scratch or cause indentations on the flooring material . . . There is a discussion of the various types of flooring materials . . . and their individual ability to withstand abuse and pressure . . . There is also a valuable chart which summarizes all of the information contained in this feature.

The theatre operator who takes the time to study this article may be pleasantly surprised to learn that there are simple . . . inexpensive methods of reducing flooring maintenance costs . . . and increasing the life of costly flooring materials.

The pesky problem of indentation of resilient flooring, the scratching and marking of hardwood floors, and the matting of carpet fabrics by the legs of furniture can be solved so easily and inexpensively that it's surprising that it remains a problem at all. The answer is the use of furniture rests.

Specially Designed

Furniture rests available today have been specially designed to prevent indentation and scratching of almost any flooring material by even the heaviest pieces of furniture. The rests are made for almost all types and sizes of furniture and are generally so designed that they are unobtrusive, sometimes an even attractive addition to the legs of furniture.

The principle of furniture rests is simple. They merely distribute the weight of the furniture over a wider area, allowing more of the floor to share in the weight supporting chore. The rests also provide a smooth, easy sliding surface to the points of furniture so that the floor finish is not scratched or marred by the movement of the furniture.

Resilient floors, like asphalt tile, linoleum, rubber tile, cork tile, and the new family of plastic materials are softer and quieter underfoot than other type floors. Because of these same resilient qualities, however, concentrated weight — weight which remains in one spot over a period of time — may result in depressed spots under the legs of furniture. The same weight mars the carpet fabrics, too.

Safe Floor Loads

Resilient floors will stand loads up to a certain point without showing ill effects, the same as non-resilient floors. For example, linoleum, one of the most popular types of resilient floors, can withstand a limit of 75 pounds per square inch without denting. With asphalt tile, the limit is 25 pounds; cork tile, 40 pounds. Rubber tile will take as much as 200 pounds to the square inch without indentation.

Often, however, the weight demands are greater than the safe limit. Then furniture rests or cups are needed.

Various Sizes and Shapes

Furniture rests and cups come in various sizes and shapes. Basically, four types of rests are recommended: Nail type, cotter pin type, rests for metal tubular furniture, all with ball and socket construction, and cup types — both round and square.

The type of furniture leg largely determines the type that should be used. Where the leg is solid wood, either the nail type or cotter pin type can be inserted after a hole is bored in the leg. The ball and socket feature allows tilting of the furniture without having the rest leave the flatness of the floor. The larger square and round cups are for use on furniture with legs of wide diameter.

Until recently, suitable rests for furniture with round, hollow, metal legs were hard to find. Since then, a new kind of rest specifically designed to "cure" this condition has been introduced to the market. When this rest is inserted into the hollow leg, a serrated, parachute-type washer expands preventing the rest from disengaging.

The recommended size of the rest or cup is controlled by the weight of the particular furniture. Charts which list the sizes of rests in relation to the weight are compiled on the basis of the weight received by *one* leg. The charts are used as a guide to the size of the furniture rest required. For example, on an 800-pound piano the floor surface under each leg would receive 200 pounds of possible indentation weight. The rest used would be the one shown on the chart for 200-pound weights. In the case of linoleum, a rest two and seven-sixty-fourths inches wide would be needed for each leg. One two inches wide would be required for asphalt tile, since the type of floor makes a difference, too.

Rests should not be limited to furniture used on resilient flooring and carpeting. The same rests will protect wood floors as well, and on concrete floors the rests will prevent the legs from cracking and chipping.

Furniture rests are so economically priced and so quickly and easily installed that there's little reason why they are not universally used to prevent indentation and damage to fine flooring surfaces.

Weight (Per Leg) of Fully Loaded Furniture	Linoleum and Plastic Flooring	Linotile	Excelon Asphalt	Rubber	Cork
Up to 50 lbs. Per Leg	1-3/16" dia.	1-3/16	1-5/8	1-3/16	1-5/8
50-100 lbs. Per Leg	1-5/8	1-3/16	2-17/32	1-3/16	2-7/64
100-150 lbs. Per Leg	1-5/8	1-3/16	1-3/4	1-3/16	2-17/32
150-200 lbs. Per Leg	2-7/64	1-3/16	2	1-3/16	2-17/32
200-250 lbs. Per Leg	2-7/64	1-5/8	2	1-5/8	2-17/32
250-300 lbs. Per Leg	2-17/32	1-5/8	2	1-5/8	2-17/32

THIS CHART indicates the various furniture rests available for different types of floors.

Networks for Theatre Television

A Study of the Bell System's Part in Providing Channels To be Used for Theatre Television Network Transmissions

By C. A. Bartlett
Engineer, American Telephone and Telegraph Co.

BRIEF: *Although the past year has seen a lack of much activity in the field of theatre television . . . due of course to such things as the introduction of CinemaScope and other exciting innovations . . . there seems to be little doubt that this medium will find its place in the motion picture theatre industry.*

In order to aid the reader to get a fuller understanding of what exactly is involved in the establishment of a theatre television network . . . we are presenting this article . . . which attempts to underline and clarify some of the subjects involved in the transmission of television programs directed into theatres.

The author of the article also makes the point that . . . although theatre television channels are not as plentiful as they might be . . . there are enough of them available to meet present needs . . . and with new equipment and systems almost ready to be put into use . . . there should be no shortage of theatre television channels when the demand increases.

The rapid growth of television has given the average family owning a television set a ringside seat at some of the nation's important historic and entertainment events — political conventions, the World Series, Presidential inaugurals and even grand opera. The interest in these events is real, and television has added large numbers of fans to the viewing public as compared to the relatively few who were eye witnesses at the events prior to television.

The motion picture industry, in an effort to provide a share of these ringside seats for its patrons, has been investigating the possibilities of theatre network television since the early days of TV. The first intercity transmission of a program for use in a theatre was on May 1, 1948. By early 1951, a theatre network linked a number of cities along the eastern seaboard and extended westward to Pittsburgh, Cleveland, and Chicago. Later that year, the network was gradually extended to other eastern and midwestern cities and the larger cities on the Pacific coast. The program televising the Marciano-La Starza boxing exhibition in late 1953, fed 45 theatres in 33 cities, and is an example of the present day network.

Network Facilities

The Bell System currently furnishes network facilities for all the major television broadcasting companies, for theatre television, and for such occasional special uses as company meetings, medical gatherings, and sessions where industrial or commercial products are introduced and displayed for customers. The network facilities provided for such services are used, in general, in conjunction with the telephone company plant employed for message telephone and other requirements. The sound portion of the television program is provided over separate high grade audio channels which, in general, parallel the video route in order to keep the transmission time of the picture and sound at about the same values.

When the first intercity theatre television network was established, the channels available for television services of all types totaled 900 miles, consisting of one channel in each direction between New York and Boston, and a similar set of channels between New York and Washington. At the end of 1952, there were about 30,000 channel miles of intercity television circuits available. Now, about 54,000 channel miles of Bell System facilities are in service and extend to almost every area of the United States. Of these facilities about 36,000 channel miles are on radio relay systems and about 18,000 on coaxial cable. The layout of existing as well as planned intercity television network routes is shown in Figure 1. These networks, on May 1, 1954, were serving 296 stations in 187 cities.

In addition to the intercity networks, the Bell System also furnishes local video channels within cities. These facilities provide the connections between the broadcasting studios, or theatres, and the intercity networks as well as between the studios and the radio transmitters.

Wide Band of Frequencies

Transmission of pictures suitable for theatre presentation over network facilities requires, fundamentally, a transmission system capable of carrying a very wide band of frequencies, with nearly linear phase and attenuation characteristics over the frequency band, and producing very little noise. The two types of intercity facility used by the Bell System for this purpose — radio relay and coaxial cable — can also serve in the telephone plant to carry hundreds of message telephone circuits, one television program, or a combination of the two, depending on the type of system.

Radio Relay System

The radio relay system principally used for television circuits to date is known as the Western Electric TD-2. This system is capable of providing up to six broadband channels in each direction and usually consists of a number of radio links, normally from 25 to 30 miles in length. At the junction of the radio links, the incoming energy is received, amplified and transmitted to

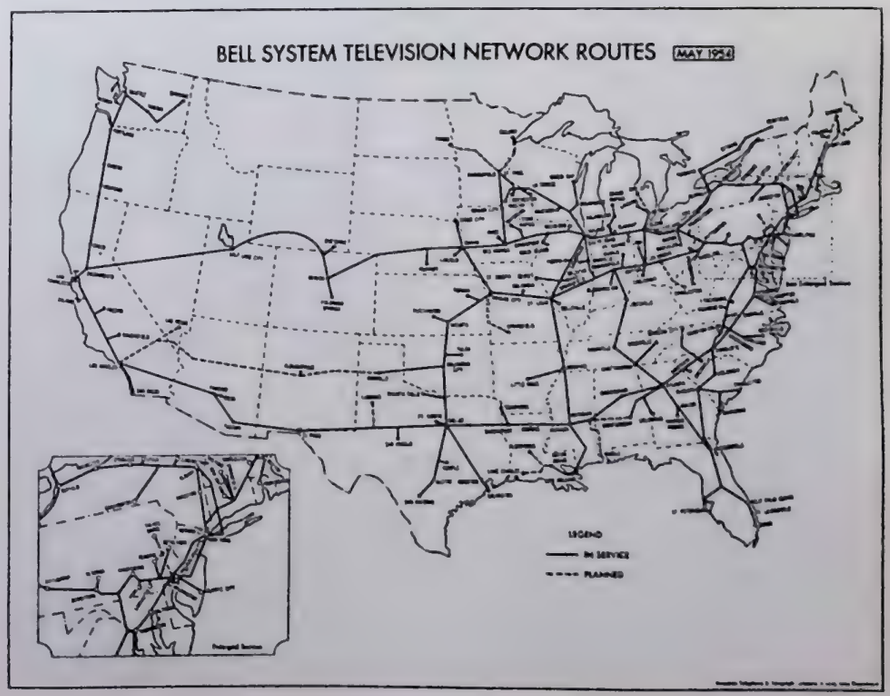


FIGURE 1 shows layout of existing, as well as planned intercity television network routes that will make greater theatre TV activity possible.



FIGURE 2 illustrates a typical radio repeater station and tower that aid in TV transmission.

the adjacent link. The amplification points are called repeater stations. Separate antennas, designed to beam the radio waves along a narrow path, are used for receiving and transmitting at each repeater station. Thus intermediate stations ordinarily have four separate antennas. Antennas are mounted on towers of sufficient height to provide line of sight transmission; the height depending on the terrain encountered, higher towers being required in flat country. To the extent practicable, use is made of high natural elevations for the repeater stations in hilly or mountainous country, thus reducing the height of tower required. A typical repeater station and tower is shown in Figure 2.

The TD-2 system uses frequencies in the 3700 to 4200 megacycle range, transmitting on an FM basis. The 500 mc available band is divided into 12 one-way channels, the mid-band frequencies of which are 40 mc apart. Channels with adjacent frequency assignments transmit in opposite directions, thus producing six channels in each direction. In adjacent sections the same frequencies are used with directions of transmission reversed. Such a plan conserves frequency assignments and reduces cross-talk between channels to a workable minimum.

To guard against interruptions, one channel of a system in each direction is usually assigned as a protection standby. A switching system has been designed to replace automatically the working channel with the standby channel whenever trouble is experienced. When the trouble is cleared, the original channel is automatically switched back into service.



FIGURE 3 shows the cross-section of a coaxial cable needed for long range TV broadcasting.



FIGURE 4 is a typical coaxial cable repeater hut used in the two Bell coaxial cable systems.

Where economic and service conditions justify, radio relay systems of types other than the TD-2 have been used. Such a condition might exist where short systems are involved, where requirements are of short duration, or where portable units are required to meet short installation intervals.

Coaxial Cable Systems

A coaxial cable usually consists of eight coaxials in one cable sheath. Each coaxial is used as a one-way broad band channel and in the usual case two coaxials are paired together (one transmitting in each direction) to provide a two-way coaxial broad band channel. The coaxial consists of a copper tube with a copper wire located at its center. This wire is suspended throughout the length of the cable by insulators spaced about an inch apart. This type of structure confines the electromagnetic field largely within the tube and there is small susceptibility to interference from outside sources of energy at frequencies above 50 kc. The copper tube in the type of system used in most cases for television is three-eighths of an inch in diameter.

There are two types of coaxial systems in use in the Bell System at the present time. The original system is known as "LI" and the later as "L3." The "LI" has amplifiers, used to compensate for attenuation in the coaxial, located approximately eight miles apart and will transmit frequencies up to about 3.1 megacycles. The "L3" system uses amplifiers spaced approximately four miles apart and will transmit frequencies up to about eight megacycles. This latter system will provide over three times as many circuits as the former, using present standard

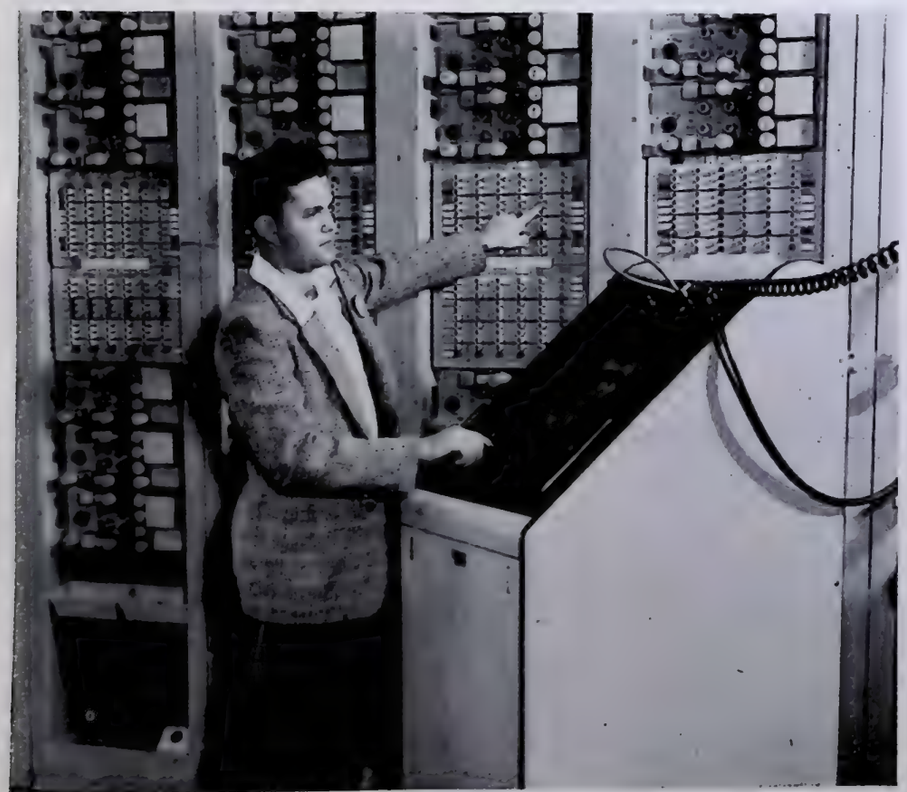


FIGURE 5 shows a switching panel capable of handling 20 incoming and 24 outgoing channels.



FIGURE 6 shows two types of microwave equipment on top of the Empire State building used to provide local channels in and around New York City, the greatest TV concentration area.

terminal equipment. Figure 4 shows a typical L repeater hut.

As previously mentioned, the coaxial cable system is not satisfactory for transmission of low frequencies, so that it is necessary to utilize carrier techniques to shift the television signal to a frequency band which the system will handle. The carrier frequency used with the "LI" system is 311 kilocycles and with the "L3" system 4.139 megacycles. Both systems employ vestigial sideband transmission, transmitting the upper sideband entirely, but only a vestige of the lower side band. In the "L3" system the frequency band below three megacycles is used for transmission of 600 telephone circuits on the same coaxial as the television signal.

Coaxial cables usually have a coaxial line in each direction set aside as a standby for replacing any of the other lines in case of trouble, similar to the arrangement used with the radio relay system.

Television Operating Centers

The intercity television channels, whether they are of the coaxial or radio relay type, terminate in a central test point or operating center. Such centers are located at strategic points along the main routes to provide supervision and control of the use of the facilities, as well as to provide points where maintenance work and testing can be handled. The actual television network assignments made to the broadband facilities vary considerably throughout the period programs are supplied, and switching panels are provided at the control centers to switch different programs to the intercity facilities as desired by the various network or "closed circuit" customers. Service to an individual station along a route also requires the use of a switching panel as a station may take service from any one of three or more networks on successive programs.

Similarly, switching panels are used to set up a theatre television program where a number of theatres along the intercity trunk route are to be switched to the main trunk line. To enable rapid and accurate switching under such circumstances, all incoming circuits and all outgoing circuits in a particular operating center are connected to a push button switching panel which enables any outgoing circuit to be fed from any incoming circuit by pressing the proper button. Figure 5 shows a switching panel capable of handling 20 incoming and 24 outgoing channels. A switching panel of this type makes it possible to make the most economical use of available line facilities, particularly throughout the busy periods of the day since assignments can be changed in a matter of seconds.

Most of the switching that is done at other than the terminals of the network along a microwave route is performed at intermediate radio frequencies, rather than at video frequencies, to avoid the accumulation of distortion which might occur if the signals are modulated to video frequencies and then modulated



FIGURE 7 shows some of the equipment installed in Chicago for a national political convention.

back to the higher frequencies at each switching point. Such switching is accomplished by means of remotely controlled switches under the control of an operating center.

Local Channels

The operating centers also provide for connections between intercity and local channels using the same push-button switching panel as for intercity facilities. These local channels may transmit a program to the network, such as one picked up at a theatre or a baseball field, or may transmit the program furnished from a distant point to a local theatre or television station. They may also be used for connecting studios with transmitters and other local pickup points. The facilities used for furnishing local channels may consist of either cable or microwave radio facilities.

Local or short haul microwave facilities used by the Bell System are generally single channel systems and can be either portable or permanently installed, depending upon the type of service to be given. Figure 6 shows two types of microwave equipment on top of the Empire State building which are used to provide local channels in and around New York. Figure 7 shows some of the equipment installed in a temporary manner set up in Chicago for one of the national political conventions held there in 1952.

Local channels using cable facilities generally consist of special shielded pairs with amplifiers spaced three to four miles apart. These amplifiers and the equalizer equipment associated with them are designed to transmit frequencies up to about four megacycles. Transmission over these facilities is at video frequencies. The balanced construction of the pairs helps prevent low frequency interference and noise which would be present if coaxial cable construction were used for the same frequency. An installation of video amplifiers in a telephone central office is shown on Figure 8.

Transmission Testing

Television circuits must perform very precisely with regard to both amplitude-frequency and delay-frequency characteristics in order to produce good television pictures. In order to maintain the channel facilities with such precision, routine tests are made at periodic intervals, using special testing equipment by which individual equipments, transmission channels and entire networks are measured and necessary adjustments made to provide satisfactory transmission. Many new and intricate pieces of testing equipment have been developed to meet these needs and to make available to the tester a means of watching a wave pattern moving at a rate of millions of times a second to determine if the network is doing its job as it should.

As an example of this new test equipment, Figure 9 shows a visual gain and delay set which provides a measure of delay and amplitude responses on an oscilloscope.

CONCLUSIONS

Future theatre network developments will be shaped by the needs of theatre television. If more circuits similar to those in use by television broadcasters are required, these can be furnished. The development of improved camera and projector equipment, or of a theatre color television system are possibilities which might require network channels of greater band width to realize their full capabilities. The Bell System now has facilities in its "L3" coaxial cable system and its TD-2 radio relay system which are capable of carrying a band width up to eight or 10 megacycles.

Future systems, one of which is already in the planning stage, will be capable of still greater band widths. With reasonable advance notice requirements, the Bell System expects to be able to meet the needs of theatre television with regard to both quantities of circuts and quality of transmission.

FIGURE 8 is an illustration of a video amplifier installation in a telephone central office designed to transmit frequencies up to four megacycles.

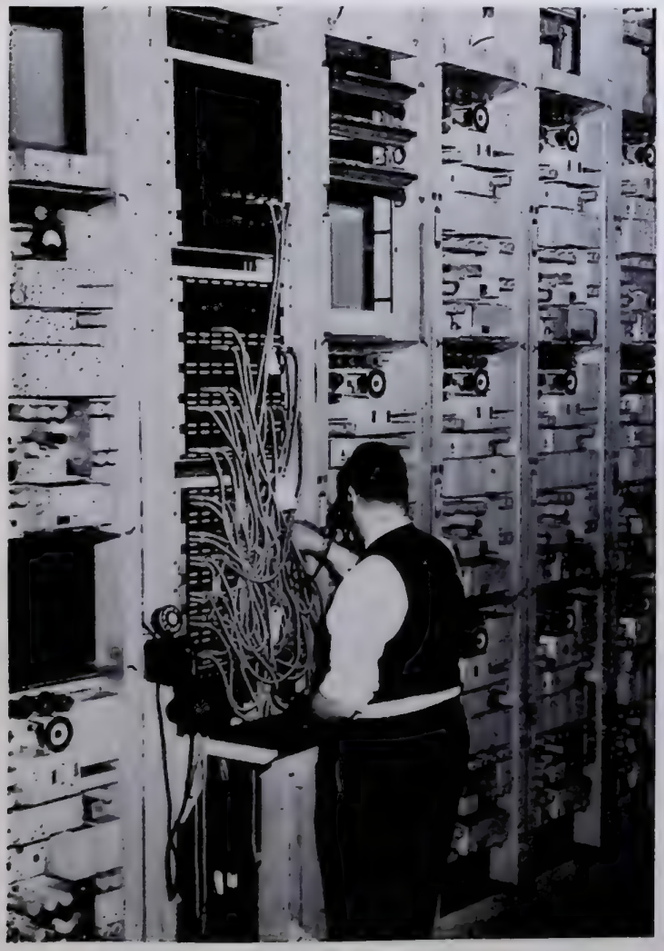


FIGURE 9 is an example of new test equipment developed to maintain perfect television transmission both to networks, and closed theatre TV.





FAST BECOMING THE STANDARD of QUALITY for Theatre Washrooms

NEW "C" MODEL *Electric-Aire* HAND DRYERS

NEW "C" MODEL Electric-Aire HAND DRYERS provide a dependable, economical, attractive drying service that will give 20 to 30 years of dependable drying service.

They allow the use of maximum washroom space for their compactness eliminates crowding of washroom floor space. Because they eliminate all need for towels, dispensers and waste containers, they automatically keep your washrooms looking neat, clean and free of unsightly towel litter.

"C" Model Electric-Aire Hand Dryers provide your patrons with a fast, chap-free, thorough hand and face drying service that creates goodwill towards your theatre.

The volume of orders and reorders is positive proof that Electric-Aire is fast becoming the most popular hand dryer made. Preferred by management, popular with patrons. . . . Electric-Aire Hand Dryers are the Standard of Quality for theatre washrooms!



"C" MODEL Electric-Aire HAND DRYERS
Improve the appearance of any theatre's washrooms!



RECESSED "C" MODEL
Designed for installation *in* new theatres or *in* remodeled walls of older theatres. Projects only 3¾" from surface of the wall.



SURFACE MOUNTED "C" MODEL
For quick, easy, inexpensive mounting *on* existing walls. Projects only 6-5/16" into the washroom.

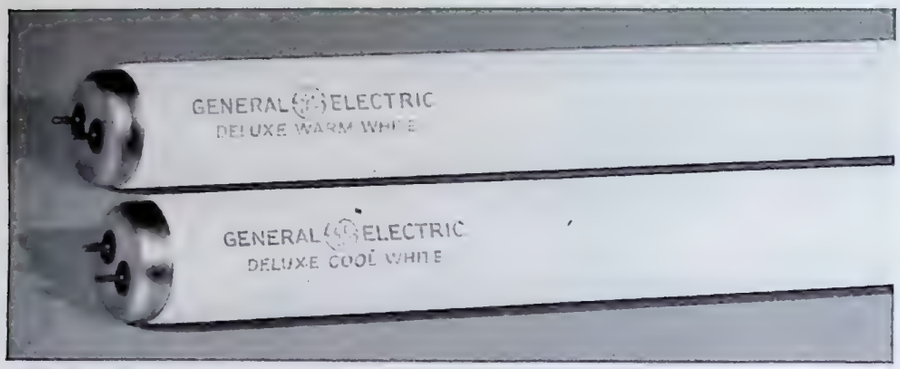
AVAILABLE: COMPLETE INFORMATION — WRITE DIRECT TO DEPT. L

ELECTRIC-AIRE

ELECTRIC-AIRE ENGINEERING CORP.
209 W. Jackson Blvd., Chicago 6, Ill.

ELECTRIC-AIRE OF CANADA
669 Talbot Street, St. Thomas, Ontario

Whatever your lighting problem ... there's a G-E lamp to solve it!

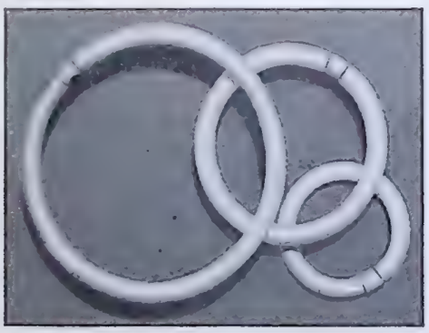


NEW FLUORESCENT LAMP FIRST TO FLATTER COLORS AND COMPLEXIONS G-E De Luxe fluorescent lamps make interior furnishings and patrons' complexions look better than ever before possible under fluorescent lighting. De Luxe Warm White lamps create an intimate atmosphere like filament lighting, are recommended for foyer, lounge and auditorium. De Luxe Cool White lamps produce a daylight effect, can be used for lobby and marquee lighting. De Luxe lamps are perfect for lighting posters and candy counters, too.

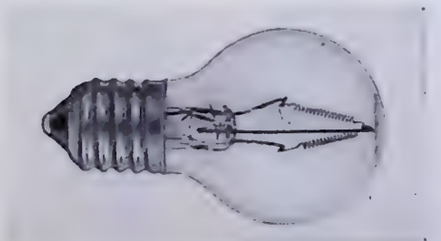


LATEST G-E LAMP DEVELOPMENT is colored 150-watt R-40 spot lamps in blue-white, pink, red, yellow, green and blue. A glass-like, color-stable coating is fired on the outside of the bulb. The blue-white and pink colors add dramatic appeal to display and down-lighting. The others create distinctive effects with maximum lighting efficiency for curtains, color coves and lobby and foyer decoration. Use these new lamps separately or combine with regular lamps for subtle results.

TO ORDER THESE LAMPS AND OTHERS, CALL YOUR G-E LAMP SUPPLIER TODAY



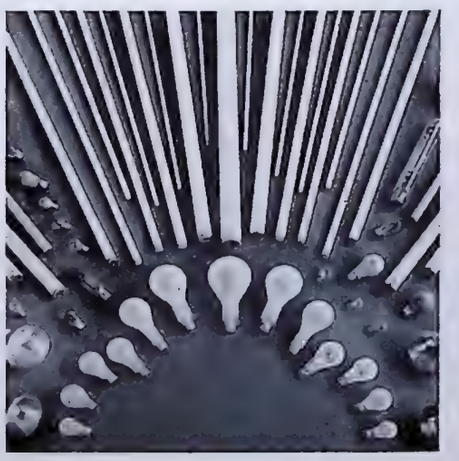
NEW DECORATIVE EFFECTS are possible with G-E Circline lamps, now in 8″, 12″ and 16″ sizes. They combine advantages of fluorescent light with a distinctive shape that adds interest to lobby, foyer and auditorium lighting.



DESTROYS ODORS! Here's a little lamp that does a big job. It's the General Electric Ozone lamp, now used by many theaters. This lamp bulb gets rid of unpleasant odors *electronically.* Use it in special fixtures in your public rooms and lounges.



ACCURATELY CONTROLLED LIGHTING When you need lamps that put light right where you want it, try General Electric PAR and REFLECTOR lamps. The PAR-38 lamp (top) is just right for spotlighting poster panels, down lighting candy counters, and similar applications. The 300-watt PAR-56 spot or flood (middle) is recommended for high intensity building or display lighting. For outdoor floodlighting, such as in parking areas, specify G-E 500-watt R-40 lamps (bottom). Also available in 150 and 300-watt sizes.

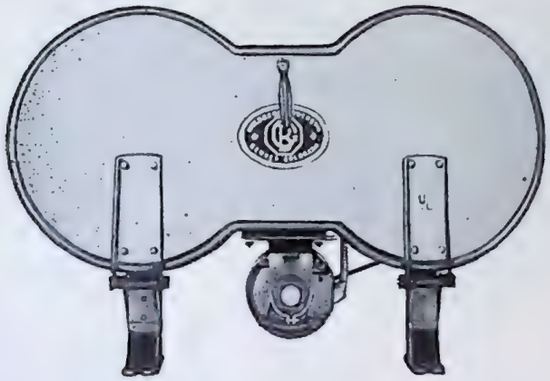


G-E LAMPS for theatre lighting range from 10-watt sign lamps in enameled colors to 1500-watt inside frosted lamps. Every General Electric lamp bulb and fluorescent tube is made to the highest standards of quality. They assure long life and dependable performance.

GENERAL ELECTRIC

For Those Who Want The Best!

GOLDBERG BROTHERS THEATRE EQUIPMENT



Safety AUTOMATIC FILM REWINDER

Passed by THE BOARD OF FIRE UNDERWRITERS. Handsome NEW brown hammertone finish. Accommodates 15" reels and smaller . . . also made to accommodate reels up to 18" and adapted for other 16mm or 35mm reels . . . reels slip on spindles quickly and easily. Equipped with automatic stop . . . made of heavy steel, carefully machined. Doors open on extra heavy counter-balanced spring hinges. Large handle keeps door perfectly tight. Control for starting.



Projection Booth TABLES AND CABINETS

NEW brown hammertone finish on tables and cabinets. Constructed of heavy angle iron, with reinforced steel top, set-in drawer, 3" block extension. Made in sizes 45" and 60" long. Cabinets made of heavy zinc bond steel, with inner reinforcement between the 1" hollow walls separating each section. Holds 15" reel of film . . . door closes automatically . . . made in units of 2 to 12 sections.



CAST ALUMINUM REELS

The reels in the biggest demand today by projectionists . . . beautiful in appearance, carefully machined, light, strong and substantially made. Lock holds the reel solid. 4 slots provide very easy threading. 15" dia. 5" hub, 14" dia. 4" hub. Packed in individual cartons, approximately 2½ pounds each.



"NO-DRAFT" SPEAKING TUBE

Prevents drafts . . . Dependable . . . Good Looking. Consists of two rust-resisting plates, chrome plated. Easily installed with washers and a screw. Carried in two sizes: 2¼" to 4¼" opening, 2¼" to 5½" opening.



SAND URNS

Sturdily built; beautifully designed; chromium trimmings; chromium plated top. 10" top diameter, 20" high, 12" bottom diameter. Red, Yellow, Blue and Green.

35 MM METAL SHIPPING CASES • METAL FILM EXCHANGE REELS • 16 MM REELS and CANS • 16 MM FIBRE SHIPPING CASES

GOLDBERG BROTHERS *Theatre Equipment*

3500 WALNUT STREET, DENVER, COLORADO

A NEW HIGH IN Safety



High jobs around a theatre are "ground safe" when you use Dayton Safety Ladders, with the exclusive "safety level" working platform. Check the "big 6" features that make Dayton your best buy:

1. **Rail-guarded "Safety Level" platform.**
2. **Locks in place automatically.**
3. **Rubber safety shoes.**
4. **Light weight—great strength.**
5. **Economically priced.**
6. **APPROVED AND LABELED BY UNDERWRITERS LAB.**

Specifications Type A
For size—Dayton Safety Ladders are measured from platform to floor.

Size of Ladder	Size of Platform	Distance Between Front Risers	Distance Between Back Standards	Line Shaft Height	Ceiling Height	Spread Between Risers and Standards	Overall Length, Folded	WEIGHT Net
3 ft.	23"x16"	18¼"	19½"	7'6" to 8'6"	8' to 9'6"	27¼"	5'-7½"	23 lbs.
4½ ft.	23"x16"	20½"	21½"	9' to 9'6"	10' to 11'	37"	7'-3¾"	33 lbs.
6 ft.	23"x16"	22½"	24"	10' to 11'6"	11'6" to 12'6"	41¼"	9'-1"	38 lbs.
8 ft.	23"x16"	25¼"	26½"	12' to 13'6"	13' to 14'6"	50½"	10'-1½"	48 lbs.
10 ft.	23"x16"	27¾"	29"	14' to 15'6"	15' to 16'6"	61"	12'-8¼"	57 lbs.
12 ft.	23"x16"	31½"	34⅛"	16' to 17'6"	17' to 18'6"	76¼"	15'-5⅞"	70 lbs.

Type H



Our extremely rugged Type-H ladder is designed and built to meet the demand for a platform ladder with a millwright-type back construction and a platform ladder that will take maximum abuse. Tool shelf on top. Other features include pinch-proof spreaders, corrosion-resistant zinc hardware, slip-proof treads. **Approved and labeled by Underwriters Lab.**

Height to Platform

Front Side Rail
4' to 12' .....$^{25}/_{32}$"x3¼"
14' to 16' .....1$^{1}/_{16}$"x3¼"

Back Side Rail
4' to 12' .....$^{25}/_{32}$"x2¾"
14' to 16' .....1$^{1}/_{16}$"x2¾"
Steps .....$^{25}/_{32}$"x3¾"
Platform Size .....18"x16"
Dowels in Back Section.....1⅛" dia.

MAIL TODAY

Dayton Safety Ladder Co.
2339 Gilbert Ave., Cincinnati, O.

Gentlemen: Please send free literature, prices, on Model A Safety Ladder and Model H Stepladder.

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

Dayton safety ladder co.

2339 Gilbert Ave., Cincinnati, Ohio
In Canada—SAFETY SUPPLY CO., TORONTO

Sign here, Mr. Smith...



Four little words...so BIG in importance!

Four little words, spoken more and more every day by ALTEC SERVICE division managers, branch managers, field representatives and 200 field engineers as exhibitors sign ALTEC SERVICE contracts.

Contracts from major circuit operators, independent chains, small circuits, "little fellows" who own one or two houses, calling for CinemaScope-stereophonic installation and service, Perspecta Sound-stereophonic installation and service. Contracts covering sound equipment which has been installed by competitive service organizations.



IZZY SEGAL, Executive of Theatre Management Associates, operating a Circuit of theatres in the Pennsylvania and Delaware areas, signs contract calling for Altec Stereophonic Service.

WHY?

Because those who have purchased varied types of sound equipment involving the new and accepted techniques know that the purchase of equipment is only one of two important steps they must take to meet increasing competition, and to reap the box-office benefits they are entitled to.

They know that the precisely manufactured, sensitive and complex components that produce the wonders of new sound will serve them best only if the equipment is accorded the type of skilful installation, service and maintenance only ALTEC SERVICE can provide.

They know that when they sign an ALTEC SERVICE contract they have assured themselves of the services of 200 expert, highly trained field engineers and supervisors who are specialists in motion picture sound.

They know that these are the same men who pioneered the installation and care of stereophonic sound systems, who are performing the same pioneering efforts in behalf of Perspecta Sound, the men who solved baffling problems, eliminated troublesome "bugs" in the early days of the "sound revolution," whose efforts helped to assure the success of the first demonstrations and theatre premieres.

Those are the reasons why more and more exhibitors every day are signing on the dotted line for ALTEC SERVICE.



SPECIALISTS IN MOTION PICTURE SOUND

ALTEC SERVICE CORPORATION

161 Sixth Avenue, New York 13, N. Y.

3 STEPS to BIGGER BOXOFFICE



ACCESSORIES



FEATURE TRAILERS

SPECIAL TRAILERS

STEP RIGHT UP! There's lots of room up there at the top . . . but you've got to take the *right steps* to get there!

Step No. 1: *Win* attention . . . *boost* enthusiasm . . . *convert* people into patrons . . . in your lobby, out-in-front, away-from-theatre, all over town . . . thru *colorful, eye-catching* ACCESSORIES!

Step No. 2: *Create* "Want-to-See" . . . with brilliantly ballyhooed samples of your Coming Attractions . . . expertly presented to your patrons . . . thru *sparkling* FEATURE TRAILERS!

Step No. 3: *Excite* them about your services, policies, special events . . . and *tempt* 'em with the lure of your Refreshment Stand . . . thru *made-to-your-order* SPECIAL TRAILERS!

So shake a leg, Brother! Put your best foot forward. Start your climb with these three Showmanship steps . . . that lead to Bigger Box Office! Sell the Bigger Show Business with Bigger Showmanship!

NATIONAL Screen SERVICE
PRIZE BABY OF THE INDUSTRY

NEW PRODUCTS, SUPPLIES, *and* SUPPLY DEALERS

1954-55

New Introductions During 1953-54

Some Thumbnail Descriptions of Selected Products With Interesting Possibilities

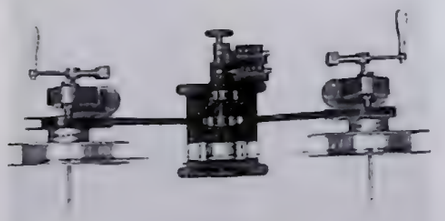
BRIEF: *Space permits only cursory presentations of some products . . . and only those that seem to have unusual idea value . . . The objective in this survey is to give the industry some recorded fact about available products and supplies that may not warrant fuller analysis or specific surveys of their own.*

PROJECTION AND SOUND

Rewind Device

A radically new device which rewinds 35mm and 16mm reels simultaneously is being marketed by the S.O.S. Cinema Supply Corporation. Known as the S.O.S. Differential Rewind Gimmick, it is said to guarantee absolutely uniform take-up. Previously the only known item of this nature is said to have been very costly and complicated.

With the "Gimmick" two different films may be rewound at the same time no matter whether they are the same size or in various sizes. The "Gimmick" is simply placed on a keywayed rewind spindle and regardless of the various sizes of the rolls or widths of the film, it is claimed that the operator will never throw slack. Proper balancing of reels is also assured and users find they can go through the film synchronizer backward and forward at will.



Hilux Variable Anamorphic Lens

Hilux Val, made by the Projection Optics Company, is an attachment for the purpose of spreading an anamorphic squeezed print. The maximum magnification of Hilux Val is two times. Such magnification is achieved by two highly corrected achromatic prisms which can be rotated independently, resulting in desired spread and side shift.

The setting of the attachment is accomplished by adjusting the two rotating knobs until the proper spread and the proper lateral or side to side location of the picture is obtained. Once the projectionist has found the proper setting, markings can be made on the matte surface of the two knobs so that this setting can be relocated quickly in the event a print of a different squeeze has to be shown.



The mounting of the Hilux Val attachment is accomplished by simply screwing it onto the front of the projection lens barrel. The unit is available to fit either the small $2\frac{25}{32}$ inch diameter lens, or the high speed four inch diameter lens.

Carbon Cooler

The source of light in a carbon arc is highly heated carbon particles commonly called soot. These very minute particles of carbon are also ionized, that is, each particle has an electrical charge. In an arc these particles do not remain completely in the hottest part on the arc, but fan upward and from the tail flame. The light from this tail flame, not being at the focal point of the mirror or condenser, throws a diffused light on the screen, causing fuzziness and tail flame which is annoying to the audience.

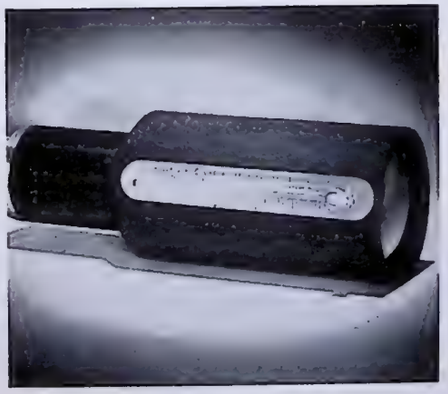
In order to avoid this situation, the Hydro Carbon Cooler, made by the Huff Manufacturing Company, is equipped with a patented magnetic tail flame stabilizer which pulls the tail flame down into the hottest part of the arc. This not only is said to eliminate the fuzziness and flicker from the screen, but in pulling more carbon particles down into the arc, it makes the incandescent ball brighter and larger.

The Huff Hydro Carbon Cooler cools all of the carbon and the working parts of the lamp, it is claimed, thus helping to supply a brighter picture by helping supply full amperage.



Vari-Focus Lens

The new Wollensak Vari-Focus projection lens is a supplementary lens which will produce any wide screen aspect ratio (non-anamorphic) when used in conjunction with the standard projection lens.



In order to install this lens it is only necessary to screw it to the front of the standard projection lens. The adjustable focus is said to provide quick, accurate matching of wide screen or 3-D projection.

All glass to air surfaces are Wocoted for maximum light transmission, contrast, and brilliance. The Vari-Focus comes complete with adapter to fit Wollensak and Kollmorgen projection lenses. To fit Bausch & Lomb lenses remove the adapter ring.

To change focal length of lens, loosen screw knobs and set to desired position. Knobs move the lens elements along a calibrated metal scale. This feature facilitates changes. The adjustable lens elements are specially mounted to eliminate ghost images and light flare.

The design of this attachment provides a means to clean the lens without

dismantling. The front element is moved to forward position. Exposed knurled edge is then turned counter clockwise and removed.

3-D Projection Aid

A new pocket instrument designed to take the guesswork out of the use of Polarized filters and 3-D movie glasses for the motion picture projectionists, has been announced by Polacoat, Inc.

Known as the Polacoat-Polarized Axis Finder, the "heart" of the device is a lens using a new pattern of polarization consisting of a concentric circularly oriented polarizer. This lens develops visible wedge-shaped shadows when polarized light is seen. For instance, when viewing a polarizer in the projection booth, the operator can instantly determine whether the axis of the polarizer is proper for 3-D projection. Also, the efficiency of the polarizer can be determined by the relative density of the wedge-shadows appearing on the Polacoat Polarized Axis Finder lens.



The angle of the axis of polarization is read directly on a calibrated scale at the rim of the lens, which is housed in a metal ring which slides between the cover plates of a rigid anodized aluminum case. The case completely protects the lens when carried as handy pocket instrument.

Metallic Rectifier

A new metallic rectifier, for use with high intensity projection arc lamps, has been announced by The Strong Electric Corporation.

This Selenium rectifier was developed to convert the three-phase alternating line supply current to direct current for use with high intensity projection arcs of from 70 to 135 amperes, it is said.

The rectifying units themselves consist of sheets of metal which are coated on the outside and are completely moisture-proof to insure reliable operation in damp climates.

Two sets of transformer taps are provided for adjusting the output current over a wide range of amperages and to compensate for variations in line voltage from 200 to 250 volts. Fine taps on the primary are connected to an eight-point external manually controlled switch which permits current adjustment while the arc is burning and without the necessity of reconnecting wires.

Ventilation is by forced draft provided by the single-phase ball-bearing fan which cools the plates to room temperature. The plates are sufficiently spaced so that the draft passes between them



and in direct contact with the rectifying surface.

The Strong selenium rectifiers are completely dry and non-chemical and since rectification is by molecular action, and no actual physical change takes place accordingly, the useful life of the rectifier is practically indefinite. There are no electrolytes to add and no contacts to clean or adjust. Strong selenium rectifiers require no attention or maintenance as the entire equipment, with the exception of a heavy duty cooling fan, has no moving parts to wear out, make noise or disintegrate, it is claimed.

Unit construction permits the easy removal for inspection of any of the various component parts. The transformer, switch and fan form the top assembly and the rectifier elements a separate unit in the base.

A remote control relay permits convenient starting directly from the projector and an air-flow switch assures protection against ventilation failures. Strong selenium rectifiers are built in single lamp units and in three sizes adjustable from 70 to 90 degrees, 90 to 110 amperes, and 110 to 135 amperes.

FOR DRIVE-IN THEATRES

Prevent Cesspool Clogging

A new bacteria discovery, specifically designed to prevent cesspool clogging all year round in a single application, was



recently announced by the Fermex Company.

The new product, which is being marketed under the name of Formula FX-7, is said to be the result of selecting and adapting several bacteria strains that continuously produce proteolutuic enzymes by feeding on the organic matter within the cesspool. It is claimed that because of its active nature the bacteria culture reproduces itself, thus assuring year-round prevention of cesspool clogging.

According to the manufacturer, Formula FX-7 is safe and easy to use, and is not harmful to the plumbing, the cesspool, or the bacteria therein. It is used by simply pouring the contents of a quart can into the toilet bowl and flushing.

Magnetic Road Sweeper

A new magnetic road sweeper, designed to remove tacks, nails and other tramp iron from such places as drive-in theatre ramps and entrances, was recently developed by the Eriez Manufacturing



Company. Called the Super-Sweeper, it can be pushed, pulled, or suspended, and is made in three strengths and four widths: 24, 36, 48, and 60 inch sizes.

The handle is of tubular steel which is easily removed for storage and transportation. The Super-Sweeper's powerful Alnico V magnetic element will snap up and hold iron which comes in its path, it is claimed. A loop at the end of the steel handle can be attached to almost any trailer hitch. The wheels are fitted with puncture-proof 8.00 by 2 inch tires. Heavy-duty models operate efficiently at speeds up to 10 miles per hour.

In-Car Speakers From First-American Products

The availability of a new line of in-car speakers was recently announced by First-American Products, Inc.

At the present time two models are being offered—the Chief with a three and one-half inch speaker, and the Super Chief with a four inch speaker. Both speakers have cast aluminum junction boxes which contain a wholly-enclosed line transformer with larger terminal strips to simplify "hook-up," it is claimed. They are available with or without down lights, and designed to mount on one and a half, and two inch pipe, or two inch tubing.

The magnet and pole tip in the speakers are permanently held in place by the tension of a spring metal cup, and every

joint in the speaker housing is cemented with a bakelite cement and heat cured to make a permanent waterproof connection between the voice coil, diaphragm, leads, suspension and metal frame, it is said.

According to the manufacturer these speakers have a patented sun-proof, rainproof louver which will protect the speaker cones, and prevent their drying out and becoming brittle. Another new feature is the elimination of the volume control knob. The control is enclosed within the speaker housing and the control shaft is elongated and knurled for easy turning.

The speakers come in an attractive two-tone finish.

Reflectorized Signs

The Ardley Company is offering a product which should prove to be of great interest to operators of outdoor theatres. This firm is marketing a new line of reflectorized signs.

These signs are printed on heavy, tempered, weatherproof masonite, and are available in many brilliant colors, according to the manufacturer. They may be placed on any tree, post, fence, shed or any other roadside object. The signs are effective during the day, but are especially useful at night when the auto headlights cause the signs to be extremely readable, even at a distance. It is pointed out by the firm that this feature prevents patrons from making a wrong turn or missing a turn off.



Some other advantages of these reflectorized signs, it is claimed, are that they do not require any wiring or other lighting equipment, and they are inexpensive.

Jewel-Tone Speaker

A new in-car speaker for drive-in theatres, known as the Bevelite four-inch Jewel-Tone, is being manufactured by Theatre Specialties, Inc.

According to the manufacturer, the new speaker is designed to give the utmost in tone quality, combined with rugged construction for longer lasting service.

The unit has a four-inch speaker which produces full range sound at all levels, it is claimed. This unit is in an attractively designed case constructed entirely of Tenite II, a new plastic. The case is so constructed that it will give complete weather protection to the speaker itself without diminishing its tonal quality.



Volume control is easily operated, but cannot be twisted or pulled off. The speaker and volume control are mounted on a single yoke which can be removed and replaced quickly, and with no special tools.

The junction box of the speaker is illuminated and has a die-cast aluminum base with a cover of Tenite II. Removal of the cover makes all interior connections easily accessible, it is said.

Tiny Tractor

An interesting and versatile new piece of equipment for the outdoor theatre is the Bantam Tractor that is being manufactured by the Standard Manufacturing and Sales Company.

The Bantam is exactly what its name implies; a small edition of a standard size tractor. It has automotive type steering and a complete transmission of two speeds, forward and reverse. A seat and foot stirrup is said to allow the operator to relax while driving the unit. The three-horsepower Briggs and Stratton engine, with a 50 to 1 gear reduction, is said to give the Bantam enough power to pull over one ton of weight.



The Bantam is 50 inches in length, 30 inches wide, and 30 inches high, with a total weight of 265 pounds.

Available with a full set of attachments, this tractor can do a variety of jobs around a drive-in, according to the manufacturer. Included among these are cleaning up the field with the trailer truck, mowing weeds and grass, spraying the area, grading loose gravel in the driveway, to pull kiddie rides, etc.

Rainmaster Speakers

During the past season Motiograph introduced a new Rainmaster series of in-car speakers.

These speakers are made of lightweight die-cast alumnium, and all of the metal parts of the speaker units and volume controls are said to be specially plated to resist corrosion. The face of the speaker unit is covered with a taut line cover that has been impregnated with a waterproof and dustproof chemical that prevents moisture, grist, and dust from reaching the speaker unit cone, it is said.

The housing of the speaker is made of two pieces of light, but strong aluminum, and will not crack, dent or warp, according to the manufacturer. As a result of the housings' rugged construction, the speaker may be quickly taken apart and reassembled. The fact that



only two patented screws hold the housing together also contributes to easy maintenance.

The unit is made up of the Rainmaster four-inch speaker, a volume control, the cord, and the front and back of the case. There are no core pads or springs to deteriorate.

Toilet for D-I's

An item which should prove to be important to drive-in operators is the new Safeway toilet made by Safeway Sanitation.

Especially designed for areas with drainage problem this toilet is said to use only one quart of water per flush. Another feature is that it cuts the length of drainage fields about 75 to 80 per cent.

The maintenance costs are practically nil, it is claimed, because Safeway toilets cannot be blocked, are never out of service, and do not overflow. Articles dropped into the toilet can be recovered, or will go directly into the tank below.



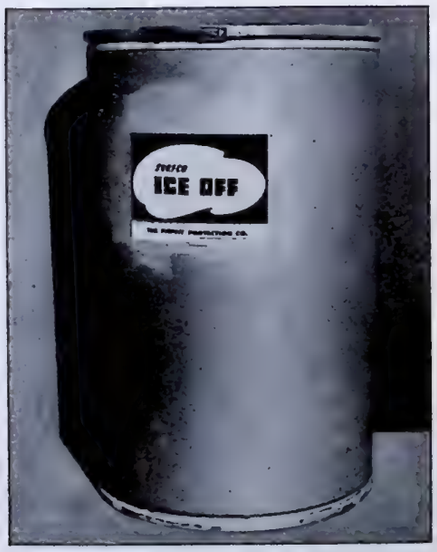
Modern in appearance, the bowl is made of vitreous earthenware. A stainproof skirt of satin finish Monel Metal covers the cast iron base. All working parts and fittings are made of nonferrous metals to prevent rusting and reduce corrosion. A special hard bronze is said to be used on all points where excessive wear occurs.

FOR FRONT AND LOBBY

Ice-Snow Remover

Theatremen should be interested in a new type anhydrous substance called Ice-Off, said to be 97 per cent active for snow and ice removal. Manufactured by the Surface Protection Company, Inc., Ice-Off is made in dry pellet form and is said to thaw snow and ice with 10 times the power of flake calcium chloride at 10 degrees F., without corrosive or bleaching action.

It is claimed that this product is free of insoluble residues and is harmless to vegetation, rubber, concrete, and clothing. Ice-Off is simply applied by sprinkling the pellets on ice or snow. The internal generation of heat provides fast melting action, according to the firm. It may be applied at the beginning of a snow fall and will keep surfaces clean for hours.



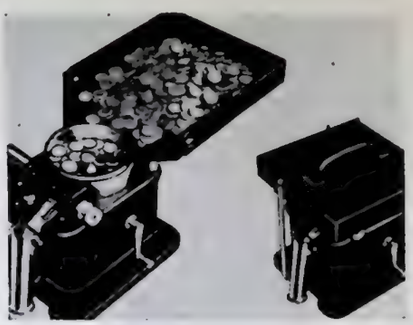
Ice-Off is supplied in a convenient two-pound carton with a spout for easy pouring. Cartons are asphalt lined to prevent caking, and packed six in a case. Bulk containers are also available.

Coin Counter

A new portable coin counter that folds compactly, weighs only one and one-quarter pounds, and is equipped with a carrying handle, is now being manufactured by Klopp Engineering, Inc.

The manufacturer claims that the new machine counts pennies, nickels, dimes, and quarters, and packages them for bank deposit, 15 times faster than the work can be done by hand.

Complete accuracy is one of the features claimed for this new device. A single adjusting knob is all that must be set. If the coins are being packaged a second knob is turned to the number



of coins per pack and coin flow and count automatically cut off when the stipulated number of coins have been packaged. The manufacturers say that the set-up is a matter of only five seconds.

Sand Urns

Sand urns in a series of modern designs are currently available from the Lawrence Metal Products Company. It is claimed that a large variety of specialized styles individual to the purchaser are possible by varying the banding effects. Over the cylindrical aluminum shell are placed bands of brass or bronze in varying widths. Anodized aluminum bands in gold, bronze, cocoa, red, or blue are also used to give a tasteful contrast.

An extremely wide range of modern and classic styles are provided by other materials such as brass, bronze, copper, spun aluminum and chrome. Also available are steel urns in black, gray, green, or maroon stock colors in a baked enamel wrinkle finish. All urns feature removable sand trays or a refuse slide and bucket combination in which a lighted cigarette is quenched by water.



Electronic Barker

An electronic "barker" who can deliver his pitch thousands of times with perfect fidelity and high volume is now available to the trade in a low cost unit developed by the Mowhawk Business Machines Corporation.

The new Message Repeater Junior is a highly compact device which delivers a pre-recorded talk from a magnetic tape cartridge through a five-inch speaker. This machine may be placed behind lobby displays to lend voice impact to advertising signs, to push popcorn and candy sales, to deliver a message to patrons in the parking lot, for crowd control during the break, etc.

The magnetic tape which is used as the recording medium, is enclosed within a cartridge the size of a pack of cigarettes, and cartridges are interchangeable.



Coin Changer

The availability of a new, low priced coin changer was recently announced by the Cee Kay Manufacturing Corporation.

The body is made of lightweight aluminum alloy, the keys and coin-ejecting bars of non-rusting silicon bronze, and the springs of phosphorus bronze. The main shaft is of stainless steel. Said to be simple to use and maintenance free, this coin changer is not affected by climate or weather.



According to the manufacturer just a flick of the thumb drops a single coin into the palm of the hand. Two point contact of the ejecting bar speeds accurate delivery of pennies, nickels, dimes, quarters, and halves. Pockets in the top of the changer are designed to store coins in exact units of ten, which is said to permit speedy pick-up and exact count.

The unit holds $125 in assorted coins, and is finished in silver gray hammertone, with keys of gold lacquered polished bronze. It is mounted on rubber feet, and comes equipped with a dust proof gray fabric cover.

Sponge Rubber Pad

An item which should be of interest to concession stand operators, cashiers, and ticket-takers is the new vinyl faced



sponge rubber padding called Durapad, which is being marketed by the Durkee-Atwood Company.

Durapad is made of a strong non-staining sponge rubber compound with a fabric backing that prevents curling and provides stability. The vinyl facing protects the sponge rubber against abrasions, and provides longer wear than ordinary rubber skin types of sponge, it is claimed. It also resists oils, alkalies and other chemicals. Another feature claimed is that it serves as an ideal cushion against shock and noise.

The pad comes in 18 inch and 36 inch widths and thicknesses from one-eighth to one inch, and any length up to 40 yards. Colors are dark green, red, brown, gray, and black. It can be cleaned with soap and water, and solvents may be used for cleaning the surface without damage to the pad, it is said.

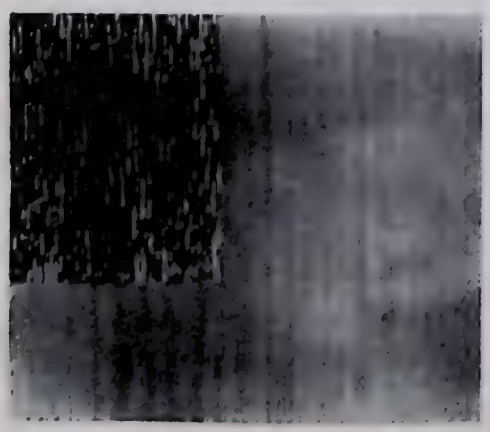
FOR INTERIOR AND AUDITORIUM

Textured Wall Covering

The textured, three-dimensional effect of natural wood is featured in a new Woodgrain series recently introduced by Bolta Products Sales, Inc.

Available by the yard or in eight by eight inch tiles, the Bolta-Wall Woodgrain series comes in prima vera, natural mahogany, gray mahogany, and African mahogany. Having a vinyl face sheet laminated to a firm rubber-saturated backing, it is easily applied to old or new walls and can even be installed around columns or bent around sharp inside or outside corners, it is claimed.

Since Bolta-Wall is cemented to the wall, there are no nails to rust or mar its appearance. When properly applied, seams are said to be practically invisible. This product wipes clean with a damp cloth, resists moisture, grease, steam, alcohol, and most staining agents. Recently, it was classified as fire-retardant material according to Federal specifications, the manufacturer says.



The face sheet of the material is up to six times thicker than the coatings used in most waterproof wallpapers. This added thickness provides protection against scratches, scuff-marks and abrasion. The manufacturer is said to guarantee that this material will not crack, chip, flake, or become brittle with age. Colors resist fading and discoloration in direct sunlight up to several times that of most wood veneers.

Powdered Soap Dispenser

Bobrick Dispensers, Inc., is marketing the Bobrick 38, a new universal powdered soap dispenser. This low-price chrome-plated powder dispenser effectively dispenses all powdered soaps including hand cleaners with lanolin, it is claimed.

The adjustable output-per-stroke valve, permits the custodian to regulate the mechanism to accommodate any powdered soap he chooses to purchase, it is said. This exclusive feature overcomes the problem created by dispensers which can handle only one type of soap.

The fingertip control offset from push-up valve, directs soap to palm of hand, minimizing spillage and messy plunger. An apron protects valve against water splash. Valve has no slide mechanism or fixed small openings to clog, and there is no continuous flow at any position of the plunger, it is claimed.



Electric Hand Dryer

The Electric-Aire Engineering Corporation recently introduced a new electric hand dryer especially designed for recessed installation in public washrooms, such as those found in theatres.

According to the manufacturer, the design permits architects and building operators to make their new or remodeled washrooms more attractive. Projecting three and three-quarter inches from the wall, the "C" model recessed hand dryer can be installed in a steel box that is conveniently set into the wall during construction. The dryer mechanism and cover plates are easily installed after walls are completed, it is claimed.

Featured improvements of the dryer are said to be increased air velocity and volume, reducing length of drying time, a permanent type air filter that can be quickly brushed without removing; touch action starter bar; new type revolving air jet baffle for convenient face and

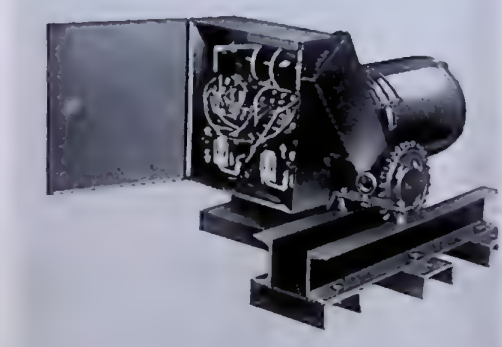


forearm drying; illuminated user instructions; vandal-proof construction and aerodynamic engineering.

Motor Control

A new motorized curtain control, especially designed for wide screen and contour curtains was recently announced by J. R. Clancy, Inc. Known as the No. 770 Peerless Model, the new control offers positive foolproof operation—start, stop, and reverse from any position, with direction clearly indicated. A visible set limits switch is also to be found. A specially designed base permits easy modifications for wide range of uses.

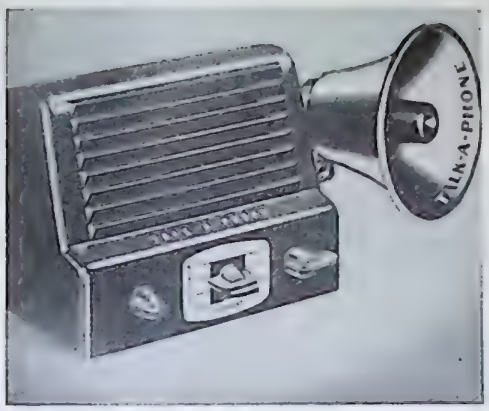
The unit is compact, requiring minimum space, and rugged in construction so that maintenance is negligible. The motor stops instantly—there is no coasting. Momentary contacts prevent burning of the points, and only four wires are required for the installation. In case of power failure, the unit is easily operated by hand without wrenches or other tools. It is available in all voltages and horsepower, as required.



FOR MANAGEMENT

Intercom System

The Talk-A-Phone Company recently announced the availability of a master selective system with 10 times the volume of conventional intercom systems for use in large areas, such as drive-ins, and to overcome high noise levels.



The line includes two units, one a master station with five substation capacity, and the other with a 10 substation capacity. The master station can talk and listen to any one substation or all simultaneously, it is claimed. Only the master station plugs into an electrical outlet. Both systems have an optional feature whereby substations can be connected privately or non-privately, and still originate calls to the master station under either application. Once a conversation has been initiated with a non-private substation, persons at substations need operate no controls and can reply from a distance, it is said. Where the system is connected privately, the master unit cannot listen in on substations.

Utility Cabinet

The General Industrial Company recently announced the production of a complete line of "See-Thru" drawer cabinets for small-parts filing and storage. One part of the theatre which should make good use of such an item is the projection booth, which is filled with many small pieces of equipment that the projectionist likes to keep around in case of an emergency.

The model shown consists of 20 crystal-clear lifetime guaranteed plastic spill-proof drawers. Overall size is 10¼ inches high, 12½ inches wide, and six inches deep.

Cabinet has a silver-gray hammer finish and is equipped with rubber feet. Adjustable drawer dividers and identification labels are included, it is said. The plastic drawers are non-combustible and safe for use in the booth.



According to the manufacturer, other "See-Thru" drawer units now in production include models ranging from eight to 128 drawers, models with larger size or metal drawers, and portable models with carrying handles. It is claimed that over 750 combinations can be supplied.

New Type Flashlight

An entirely new type of flashlight which can throw either a concentrated spotlight beam for long range use, or a diffused beam for close range was recently announced by the National Carbon Company.

Known as the "Eveready" No. 7253 Spot-Flood, this flashlight makes use of a new double filament lamp which is said to be similar in principle to that used in automobile headlamps. If one of the two filaments burns out, it is claimed that the other is always available for immediate use.

Other features of this new flashlight are its unbreakable polyethylene lens-guard, special ring-hanger, and heavy gauge plate nickel for a long lasting finish. The square shape is said to provide an easy grip.

Conventional and drive-in theatre operators should find this new item valuable.



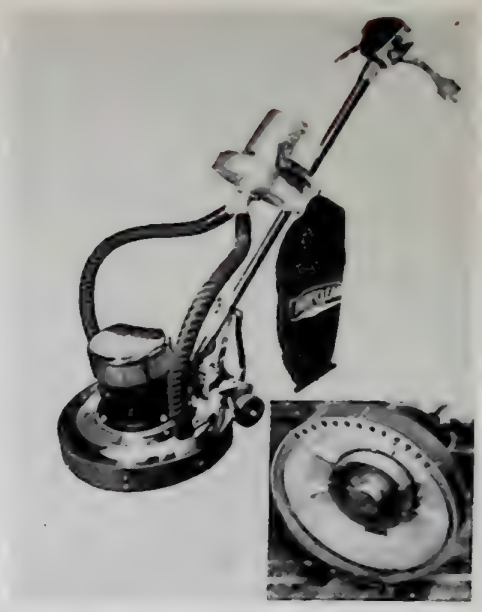
FOR MAINTENANCE

Dust Pick-Up Attachment

A dust pick-up vacuum cleaning attachment for use on Multi-Clean Products, Inc., floor machines while doing light sanding or finish sanding, was recently announced by the firm.

According to the manufacturer, the unit can be put on or taken off a heavy duty floor machine in 10 minutes by the user. The device consists of a detachable vacuum power unit with a one horsepower motor that mounts on the floor machine handle, and a suction ring assembly which clamps to the base of the machine without drilling. Both the vacuum and the machine operate together from the switch lever directly under the floor machine handle bar. If desired, however, the floor machine can be operated independently, it was pointed out.

An adjustable leather shield concentrates suction for thorough vacuum cleaning action. This, coupled with the fact that the vacuum unit is capable of a 46-inch water lift, provides ample



power to pick up all sanding dust completely, it is claimed. Dust bag is easy-empty type, and dust hoses are flexible so that the machine handle remains completely adjustable to comfortable operating position.

Quick-Setting Cement

Permanently repairing chuck holes and breaks in concrete floors and securely fastening hand rails, seats, or equipment of any type to concrete by means of anchor bolts, can now be done quickly, easily and safely with Por-Rok quick setting cement made by the Hallemite Manufacturing Company.

Por-Rok is said to successfully replace lead and sulphur for most bolt setting operations. Applied cold, there is no heating hazard, and it is claimed that it requires only a few minutes to set up.

Toilet Cleaner

The X-50 automatic toilet bowl cleaner is now being offered by the Peck's Products Company.

This new product is said to do away with scrubbing and the use of any special preparations to remove stains, since chemical action does all the work. The maintenance man drops one tablet once each into the tank (not the bowl) of the toilet. The tablet dissolves slowly, working each time the toilet is flushed, keeping both the tank and the bowl clean, it is claimed. Each tablet is said to contain a deodorant, a water softener and slime remover. There is no brush, no scouring, or work of any kind involved.



Check Your Need...

NATIONAL
THEATRE SUPPLY
Division of National • Simplex • Bludworth, Inc.

CAN TAKE CARE OF IT!

For over 28 years, National Theatre Supply has kept in stride with the motion picture industry—matching its progress step-by-step—solving each new problem, each new requirement as it came. Because of this long experience and accumulated know-how, exhibitors throughout the world have come to look upon *National* as their headquarters for all their theatre needs. They know this organization was conceived with the idea of providing only the finest equipment and service—an idea which has remained unaltered through the years.

NATIONAL is ready to serve you with . . .

Everything

FOR EVERY THEATER NEED!

☐ **PROJECTION & SOUND**

SIMPLEX XL mechanisms and SIMPLEX XL optical and magnetic sound systems.

☐ **DRIVE-IN SPEAKERS**

A wide choice of IN-A-CAR SPEAKERS to meet every requirement and budget.

☐ **ARC LAMPS**

PEERLESS MAGNARC, HY-CANDESCENT and NATIONAL EXCELITE—the complete range in amperage and price.

☐ **POWER CONVERSION**

A wide choice in HERTNER TRANSVERTERS and NATIONAL RECTIFIERS.

☐ **SCREENS**

WALKER PM, HIGH INTENSITY and WIDESCREEN—always the proper type for each individual requirement.

☐ **CHAIRS**

Comfort, appearance and economy are combined in a complete line of theatre chairs.

☐ **CARPETS**

Long wearing, available in a design to please the eye and the budget.

☐ **MARQUEE LETTERS**

Your attraction board will look better and brighter with Bevelite letters.

☐ **BOXOFFICE**

Everything for the boxoffice from a ticket register to a speaking tube.

☐ **CONCESSION EQUIPMENT**

A complete line of quality concession equipment from popcorn machines to coffee makers plus the finest of supply items.

NATIONAL THEATRE SUPPLY • 92 GOLD STREET, NEW YORK and 29 BRANCHES COAST-TO-COAST

Theatre Supply Dealers of the United States

Comprehensive Listing of Names, Addresses, Personnel, Products, and the Areas Served

ALABAMA

*BRADY MOVIE SERVICE, 308 N. 26th St., Birmingham. Telephone: 54-1362. PERSONNEL—Larry G. Brady, R. E. Lee.

THE QUEEN FEATURE SERVICE, INC., 1912½ Morris Ave., Birmingham 3. *(See display listing below.)*

THE QUEEN FEATURE SERVICE, INC., 1912½ Morris Ave., Birmingham 3. Telephone: 3-8665. PERSONNEL—*Manager:* Miss Vivian Harwell. *Salesman:* William H. McKenzie. AREA SERVED—Alabama, Tennessee, Mississippi, Georgia, Northern Florida.

AUTHORIZED DISTRIBUTOR for

OPERA CHAIRS
BIGELOW-SANFORD CARPET
WIDE SCREENS
CINEMASCOPE
COMPLETE DRIVE-IN, 3-D and THEATRE EQUIPMENT
COMPLETE CONCESSION EQUIPMENT
Complete line of Supplies and Concession Supplies

WORLD-WIDE Century DISTRIBUTION

PROJECTION and SOUND EQUIPMENT

A WORLD-WIDE REPUTATION for Top Quality and Dependability.

ARIZONA

*GIRARD THEATRE SUPPLY CO., 320 W. Washington St., Phoenix. Telephones: 4-2087 (Emergency Night) 2-9572 - 5-2711. PERSONNEL — *President:* Weldon Girard. *Treasurer:* Thelma B. Girard. *Office Mgr.:* William Ferrell, Marie King, T. C. James. AREA SERVED — Arizona, New Mexico, Colorado, Utah.

ARIZONA FILM SUPPLY CO., 33 W. Congress St., Tucson. Telephone: 26272. PERSONNEL—Nick Diamos, George N. Diamos, George O. Diamos. AREA SERVED—Arizona.

ARKANSAS

*ARKANSAS THEATRE SUPPLY CO., 1008 Main St., Little Rock. Telephones: 22632—(Emergency Night) 202067. PERSONNEL—*Owner:* H. E. "Seed" Wortsmith. AREA SERVED—Arkansas, Tennessee, Mississippi, Missouri.

CALIFORNIA

MIDSTATE THEATRE SUPPLY, 1906 Thomas, Fresno. Telephone: 3-2455. PERSONNEL—*Owner and Manager:* Paul Wallace. AREA SERVED—Central California.

J. M. BOYD CO., 2032 S. Vermont Ave., Los Angeles 7. Telephone: REpublic 2-0046. AREA SERVED—Southern California.

*JOHN P. FILBERT CO., INC., 2007 S. Vermont Ave., Los Angeles 7. Telephones: PArkway 1196-97-98. PERSONNEL — *Consultant:* John P. Filbert. *President:* J. Edward Miller. *Secretary-Treasurer:* John P. Filbert, Jr. *Salesmen:* Don M. McLaren, James E. Doolittle. *Shipping Dept.:* Robert Peterson. *Bookkeeper:* Ida K. Marshall. *Stenographer:* Frances W. Flowers.

MOTION PICTURE ACCESSORIES CO., 1678 W. 17th Place, Los Angeles 6. Telephone: REpublic 4-2894. PERSONNEL — *Owners:* James B. Dabney and James B. Dabney, Jr. AREA SERVED—Western and Coast states.

NATIONAL THEATRE SUPPLY, 1961 S. Vermont Ave., Los Angeles 7. PERSONNEL —*Manager:* Bundy Smith. *Assistant Manager:* Jack Hessick. *Salesmen:* Al Schuyler, Sam Aspaas, Cal Tyler. AREA SERVED—Southern California, Arizona, Nevada.

PEMBREX THEATRE SUPPLY CORP., 1969 S. Vermont Ave., Los Angeles 7. Used Equipment Division, 1975 S. Vermont Ave. Telephones: REpublic 1-3111—(Emergency Night) DUnkirk 8-6764, TOpaz 2-3412. PERSONNEL—*President and General Manager:* Louis M. Wutke. *Assistant Manager:* J. E. Maguire. AREA SERVED—Southern California and Arizona.

B. F. SHEARER COMPANY, 1964 S. Vermont Ave., Los Angeles 7. Telephones: REpublic 3-1145—(Night) BRighton 04901, AXminster 1-3576. PERSONNEL—*Manager:* Barclay W. Ardell. *Salesmen:* Ed Budd, Don Grieve. *Engineer:* Henry Grussing. *Counter Man:* Stanley H. Lay. AREA SERVED — Southern California, Arizona, New Mexico, Southern Nevada.

NATIONAL THEATRE SUPPLY, 255 Golden Gate Ave., San Francisco 2. Telephone: MArket 1-4171. PERSONNEL — *Manager:* Heaton Randall.AREA SERVED—Northern California, Nevada, Southern Oregon.

WALTER G. PREDDEY, 187 Golden Gate Ave., San Francisco 2. Telephones: UNderhill 1-7571-2—(Emergency Night) BAyview 1-5749. PERSONNEL — *Owners:* Walter G. Preddey, Robert O. Bemis (Copartnership). *Salesmen:* H. C. Graywood, R. L. Mann. AREA SERVED — California, Nevada, Oregon, Arizona, Hawaii, Alaska.

B. F. SHEARER COMPANY OF CALIFORNIA, 243 Golden Gate Ave., San Francisco 2. Telephone: UNderhill 1-1816. PERSONNEL—*Manager:* H. I. Tegtmeier. *Salesmen:* Wesley Rosenthal, L. R. Abbott, E. R. Bechtel. AREA SERVED — Northern California, Nevada, Southern Oregon, Hawaii.

*C. R. SKINNER MFG. CO., 292 Turk St., San Francisco.

WESTERN THEATRICAL EQUIPMENT CO., 337 Golden Gate Ave., San Francisco 2. Telephone: Hemlock 1-8302. PERSONNEL— *President and General Manager:* James R. Barry. *Salesmen:* Davis Petersen, L. Jones. AREA SERVED—California, Nevada.

COLORADO

NATIONAL THEATRE SUPPLY, 2111 Champa St., Denver 2. Telephones: TAbor 0201—(Emergency Night) Race 0392. PERSONNEL—*Manager:* Joe B. Stone. *Assistant Manager:* Dick Lutz. *Salesmen:* Bob Tankersley, Morton Dyksterhuis. AREA SERVED —Colorado, New Mexico, Wyoming, Western Nebraska, Eastern Montana, and Black Hills of South Dakota.

SERVICE THEATRE SUPPLY CO., 2054 Broadway, Denver 2. Telephones: AL 5-1597 —(Emergency Night) AL 5-1597. PERSONNEL—*President:* Ted Knox. *Secretary and Treasurer:* Elsie Knox. AREA SERVED —Denver Film Territory.

WESTERN SERVICE & SUPPLY INC., 2120 Broadway, Denver 2 .Telephone: KEystone 8041. PERSONNEL—*President:* S. R. Langwith. *Sales:* Frederic Anderson. *Office Manager:* Miss Jean Gerbase. AREA SERVED — Colorado, Wyoming, Western Nebraska, Western S. Dakota, New Mexico.

* Listing not confirmed by Supply Dealer

CONNECTICUT

NATIONAL THEATRE SUPPLY, 122 Meadow St., New Haven 10. Telephones: STate 7-5829 — (Emergency Night) WEst 3-2026. PERSONNEL — *Manager:* R. J. Mauro. *Assistant Manager:* David R. Warner. *Secretary:* Miss Frances Hogan. AREA SERVED —Connecticut.

DISTRICT OF COLUMBIA

ELMER H. BRIENT & SONS, INC., 925 New Jersey Ave., N.W., Washington, D. C. *(See display listing below.)*

ELMER H. BRIENT & SONS, INC., 925 New Jersey Ave., N.W., Washington, D. C. Telephones: District 7-9505-6, Oliver 2-1453. PERSONNEL —*General Manager:* Elmer H. Brient, *Office Manager:* Ted C. Brient. *Sales:* Robert H. Brient. *Engineers:* K. F. Owens, C. L. Rakow. AREA SERVED—District of Columbia, Maryland, Virginia, Northeastern W. Virginia, Delaware, Pennsylvania.

RCA THEATRE SUPPLY DEALER

EVERYTHING for the Theatre!

Drive-In Equipment •
13 Complete Drive-In Systems •
Equipment for THEATRE TV •
Equipment for CINEMASCOPE •
STEREOPHONIC SOUND EQUIPMENT
1 TRACK AND 4 TRACK •

• RCA PHOTOPHONE SOUND • RCA PROJECTORS • RCA SCREENS • ANAMORPHIC LENSES • GENERATORS • LAMPS • SPOTLIGHTS • STAGE DRAPES • TRACKS • DECORATING • LIGHTING • SEATS • STAIR and LOBBY MATS • FLOOR COVERING • LOBBY FRAMES • • MARQUEES • TICKET REGISTERS • CHANGEMAKERS • RCA THEATRE CARPETS • RECTIFIERS • COMPLETE LINE OF SUPPLIES • POPCORN MACHINES • REPAIRS and SERVICE • CARBONS • TICKETS • CONCESSION EQUIPMENT • ORANGE CRUSH—DAD'S ROOT BEER.

Dependable Consultation, Design, Engineering and Equipment

BEN LUST THEATRE SUPPLY CO., 1001 New Jersey Ave., N.W., Washington 1. Telephones: NAtional 8-5376 — (Emergency Night) DEcatur 2-5758. PERSONNEL — *Owner and Manager:* Mrs. Ben Lust. *Salesman:* O. F. Leland. *Secretary:* Mrs. Harold Nixon. *Service Engineer:* Berkley Williams. AREA SERVED — District of Columbia, Maryland, West Virginia, Virginia.

R & S THEATRE SUPPLY CO., 920 New Jersey Ave., N.W., Washington 1. Telephones: STerling 3-8938 — (Emergency Night) HEmlock 4-8812, EMerson 3-5686. PERSONNEL—Samuel N. Wheeler, Ross S. Wheeler. AREA SERVED—Virginia, Maryland, Delaware, District of Columbia.

FLORIDA

SOUTHEASTERN THEATRE EQUIP. CO. OF FLORIDA, 206 E. Bay St., Jacksonville 4. *(See display listing below.)*

SOUTHEASTERN THEATRE EQUIP. CO. OF FLORIDA, 206 E. Bay Street, Jacksonville 4. Telephones: 5-2661. PERSONNEL—*President and General Manager:* J. B. Dumestre, Jr. *Assistant General Manager:* Fred Bearden, Jr. *Manager:* Herbert W. Small, III. *Representative:* James Stansel. AREA SERVED—Florida.

RCA THEATRE SUPPLY DEALER

EVERYTHING for the Theatre!

Complete Sales and Service

• RCA PROJECTORS and LAMPS • RCA MOTOR GENERATOR SETS • RCA TUBE RECTIFIERS • RCA SOUND SYSTEMS • RCA SNOWHITE REGULAR and PLASTIC SOUND SCREENS • KOLLMORGEN LENS • INTERNATIONAL ALL STEEL CHAIRS • RCA THEATRE CARPETS and CARPET LINING • WESTINGHOUSE MAZDA LAMPS • NATIONAL CARBONS • THEATRE LIGHTING FIXTURES • *RCA THEATRE TELEVISION* and
Offering a complete architectural and engineering service on both new construction and remodelling.

Contact us for specially designed stage and house draperies.

JOE HORNSTEIN, INC., 273 W. Flagler St., Miami. *(See display listing below.)*

JOE HORNSTEIN, INC., 273 W. Flagler St., Miami. Telephones: 2-7596 (Emergency Night) COral Gables 67-7424. PERSONNEL — *Manager:* Hal Hornstein. *Counter Man:* E. Gilliam. AREA SERVED—Southern States.

AUTHORIZED DISTRIBUTOR for

WORLD-WIDE Century DISTRIBUTION

PROJECTION and SOUND EQUIPMENT

Complete Equipment for 3-D, Cinemascope Screens, Anamorphic Lenses, Stereophonic and Perspecta Sound, Wide Angle Lenses, Wide Angle Screen Frames, Century Drive-In Equipment, Strong Mighty 90 Lamphouses and other models, Knitron Rectifiers, Forest Continuous Duty Rectifiers, Imperial Steadypower Generators, Ideal Theatre Chairs, Raytone All Purpose Screens, National and Lorraine Carbons, A D C Curtain Controls, Wagner and Adler Letters, Sealux Aluminum Frames, Gulistan Theatre Carpets, Complete Projection Repairs and Service.

A WORLD-WIDE REPUTATION for Top Quality and Dependability.

UNITED THEATRE SUPPLY CORP., 329 W. Flagler St., Miami. Telephone: 3-5038. PERSONNEL—*Manager:* Edgar B. Pearce.

UNITED THEATRE SUPPLY CORP., 110 N. Franklin St., Tampa 1. Telephone: 2-3045. PERSONNEL — *President and Treasurer:* Ray Busler. *Secretary:* Edna L. Worth. *Counter Man:* S. W. Smith. AREA SERVED —Florida, South Georgia, Cuba and the Bahamas.

GEORGIA

DIXIE THEATRE SERVICE & SUPPLY CO., 1010 N. Slappey Drive, Albany. Telephones: HE 2-2846—(Emergency Night) HE 2-2317. PERSONNEL—*General Manager:* L. W. McClung. *Service Manager:* W. N. Ashbey. *Warehouse:* Lyle McClung, Jr. *Sales Manager:* J. O. McClung. AREA SERVED—Georgia, Alabama, Florida, Tennessee.

CAPITAL CITY SUPPLY CO., INC., 161 Walton St., N.W., Atlanta 3. Telephones: WA. 1244—(Emergency Night) CH. 6885. PERSONNEL—*President and Manager:* O. J. Howell. *Vice-President in Charge of Sales:* Lewis Waits. AREA SERVED—Georgia, Tennessee, Alabama, part of Florida.

DIXIE THEATRE SERVICE & SUPPLY CO., 95 Walton St., N.W., Atlanta. Telephone: WA 4118. PERSONNEL—*Manager:* John Sims. AREA SERVED—Georgia, Alabama, Florida, Tennessee.

NATIONAL THEATRE SUPPLY, 187 Walton St., N.W., Atlanta 3. Telephone: Lamar 8486. PERSONNEL—*Manager:* J. C Brown. *Assistant Branch Manager:* R. M. Goldsmith *Salesmen:* J. G. Thigpen, R. L. McWilliams, Jr., F. M. Lanier. AREA SERVED—Georgia, Florida, Alabama, Tennessee.

SOUTHEASTERN THEATRE EQUIP. CO., 203 Luckie Street, N.W., Atlanta 1. *(See display listing below.)*

SOUTHEASTERN THEATRE EQUIP. CO., 203 Luckie Street, N.W., Atlanta 1. Telephone: CYpress 0461. PERSONNEL—*President and General Manager:* J. B. Dumestre, Jr. *Assistant General Manager:* Fred Bearden, Jr. *Manager:* J. B. Dumestre, III. *Representatives:* W. N. Troy, Fred Nash, C. H. McLean. AREA SERVED—Southern States.

RCA THEATRE SUPPLY DEALER

EVERYTHING for the Theatre!

Complete Sales and Service

• RCA PROJECTORS and LAMPS • RCA MOTOR GENERATOR SETS • RCA TUBE RECTIFIERS • RCA SOUND SYSTEMS • RCA SNOWHITE REGULAR and PLASTIC SOUND SCREENS • KOLLMORGEN LENS • INTERNATIONAL ALL STEEL CHAIRS • RCA THEATRE CARPETS and CARPET LINING • WESTINGHOUSE MAZDA LAMPS • NATIONAL CARBONS • THEATRE LIGHTING FIXTURES • *RCA THEATRE TELEVISION* and
Offering a complete architectural and engineering service on both new construction and remodelling.

Contact us for specially designed stage and house draperies.

WIL-KIN THEATRE SUPPLY, INC., 150 Walton St., N.W., Atlanta 3. *(See display listing on page 365.)*

WIL-KIN THEATRE SUPPLY, INC., 150 Walton St., N.W., Atlanta 3. Telephone: Walnut 4613. PERSONNEL—*General Sales Manager:* C. W. Fortson. *General Manager:* Nash Weil. AREA SERVED—Alabama, Florida, Georgia, Tennessee.

EXCLUSIVE DISTRIBUTOR

MOTIOGRAPH

CYCLORAMIC Screen
ASHCRAFT Lamphouses and Rectifiers
HEYWOOD-WAKEFIELD Chairs
IMPERIAL Motor Generator Sets
AUTOMATIC DEVICES Curtain Tracks and Controls
ADLER Silhouette Sign Letters
CRETORS Popcorn Machines

We maintain Projection and Sound Equipment Repair Shops and our own Drapery Shop.

"Everything for the Theatre Except Film"

SOUND PROJECTORS and DRIVE-IN EQUIPMENT

Designed and built by specialists for over 50 years

See Complete Data on Pages 296 and 297 of this Volume.

SALES AND SERVICE BY EXPERTS!

RHODES SOUND & PROJECTION SERVICE, 218 E. 56th St., Savannah. Telephones: 3-8788 — (If no answer) 3-1174. PERSONNEL—*President:* Irma F. Rhodes. *Engineer and Mgr.:* E. L. Rhodes. AREA SERVED — Georgia, Southeast South Carolina, Northern Florida.

ILLINOIS

ABBOTT THEATRE EQUIPMENT CO., INC., 1311 S. Wabash Ave., Chicago 5. *(See display listing below.)*

ABBOTT THEATRE EQUIPMENT CO., INC., 1311 S. Wabash Avenue, Chicago 5. Telephones: HArrison 7-7573-74-75-76. PERSONNEL—*President:* Harold Abbott. *Sales Manager:* Spiro Charuhas. *General Manager:* Erwin J. Peterson. *Office Manager:* Eleanor Berger. *Installation Supervisor:* H. C. Blackwood. *Repair Dept. Manager:* Bernard Focken. AREA SERVED—Illinois, Northern Indiana.

RCA THEATRE SUPPLY DEALER

EVERYTHING for the Theatre!

Complete Sales and Service

• RCA PROJECTORS • RCA LAMPS • RCA SOUND SYSTEMS • LIGHTING and STAGE EQUIPMENT • AIR CONDITIONING and VENTILATING EQUIPMENT • RCA and DA-LITE SCREENS • RCA THEATRE CARPETING • INTERNATIONAL and IDEAL THEATRE CHAIRS • STRONG LAMPS and RECTIFIERS • COMPLETE THEATRE INTERIOR DECORATING • SPECIALLY DESIGNED DRAPERIES OF ALL TYPES • KOLLMORGEN SNAPLITE and SUPER SNAPLITE LENSES • GENERAL REGISTER TICKET MACHINES and TICKET BOXES • COMPLETE LOBBY FIXTURES and DISPLAYS • 8 and 16 M/M PROJECTORS and CAMERAS • RCA THEATRE TELEVISION • RCA 3-D EQUIPMENT.

Specialists in Drive-In Theatres

AN-GAR, INC., 2831 N. Clark St., Chicago. PERSONNEL—G. C. Anders, R. W. Dassow.

*MIDWEST THEATRE SERVICE & EQUIPMENT CO., 925 W. Jackson Blvd., Chicago.

*EDWARD MIKKELSEN, 4646 N. Clifton Ave., Chicago.

MOVIE SUPPLY CO., 1318 S. Wabash Ave., Chicago. Telephone: HA 7-1447. AREA SERVED—Entire U. S.

NATIONAL THEATRE SUPPLY. 1325 S. Wabash Ave., Chicago 5. Telephone: WAbash 2-8266. PERSONNEL—*Manager:* R. P. Rosser, Jr. *Salesmen:* K. W. Miller, I. G. Shreve, G. M. Bartlett. *Engineer:* W. J. Gramer. AREA SERVED—Illinois, Northern Indiana.

INDIANA

GER-BAR, INC., 442 N. Illinois St., Indianapolis 4. Telephone: LIncoln 1727. PERSONNEL—B. Hopkins, M. Hopkins, J. Archer, F. Leas, M. Moore.

*MID-WEST THEATRE SUPPLY CO., INC., 448 N. Illinois St., Indianapolis 4. Telephone: RIley 5655. (24 hour service). PERSONNEL—*Owners:* H. B. Snook, *President,* T. M. Fisher, *Secretary-Treasurer. Manager:* J. Charles Clickner. *Counter Man:* Carl Y. Miller. AREA SERVED—Indiana, Western Kentucky.

NATIONAL THEATRE SUPPLY, 436 N. Illinois St., Indianapolis 4. Telephones: LIncoln 4517 — (Emergency Night) BRoadway 5825, TAlbot 6490, TAlbot 5126. PERSONNEL—*Manager:* B. N. Peterson. *Salesman:* W. S. Smith. *Louisville, Ky. Salesman:* Joe W. Aspley, Magnolia 6317-J. *Office Manager:* Norma Geraghty. *Counter Man:* J. F. Bommerscheim. AREA SERVED — Indiana, Kentucky.

PROJECTION EQUIPMENT CO., Union City.

IOWA

DES MOINES THEATRE SUPPLY CO., 1121 High St., Des Moines 9. Telephone: 3-6520. PERSONNEL—*Owners:* A. E. Thiele and R. G. Faulds. *Manager:* A. E. Thiele. *Salesmen:* R. G. Faulds and H. N. Sutton AREA SERVED—Iowa.

*NATIONAL THEATRE SUPPLY, 1102 High St., Des Moines 9. Telephones: 8-8597 —(Emergency Night) 9-1075, 7-9631. PERSONNEL—*Manager:* Glenn K. Slipper. *Salesmen:* W. R. Davis, G. F. Howard, S. E. Theiss. AREA SERVED—Iowa.

KANSAS

*FRED M. WALLS THEATRE SERVICE CO., INC., 827 Wayne St., Topeka.

SOUTHWEST THEATRE EQUIPMENT CO., 118½ W. Douglas Ave., P. O. Box 2138, Wichita 1. Telephone: 2-2153. PERSONNEL—*Owner and Manager:* C. D. Peck. *Projection Maintenance:* J. O. Buckles. AREA SERVED—Kansas, Missouri, Oklahoma, Arkansas, Texas, New Mexico.

KENTUCKY

FALLS CITY THEATRE EQUIPMENT CO., 427-29 S. 3rd St., Louisville 2. *(See display listing below.)*

FALLS CITY THEATRE EQUIPMENT CO., 427-29 S. 3rd St., Louisville 2. Telephones: JAckson 7559, CLay 3186. PERSONNEL—*Owners:* W. E. Carrell, Sr., W. E. Carrell, II, J. Raymond Mattingly. *Salesmen:* Charles B. Wells, Jr., Milton Pennel. *Counter Men:* Joe Hutton, Harry Woodson. *Service Engineer:* John MacDonald. AREA SERVED—Kentucky, Southern Indiana, Southern Ohio, Northern Tennessee.

EXCLUSIVE DISTRIBUTOR

MOTIOGRAPH

Sales and Service On:
CINEMASCOPE EQUIPMENT
STEREOPHONIC SOUND EQUIPMENT
GULISTAN Carpet
IDEAL Seating
KOLLMORGEN Lenses
STRONG Lamphouses and Rectifiers
NATIONAL Carbons
ANAMORPHIC Lenses

Complete line of Drive-In Theatre Equipment

SOUND PROJECTORS ARC LAMPS and DRIVE-IN EQUIPMENT

Designed and built by specialists for over 50 years

See Complete Data on Pages 296 and 297 of this Volume.

SALES AND SERVICE BY EXPERTS!

HADDEN THEATRE SUPPLY CO., 209 S. 3rd St., Louisville 2. Telephones: JAckson 0477—(Emergency Night) HIghland 6577. PERSONNEL—*Owner:* J. Stoner Hadden. *Office Manager:* Marguerite T. Stevens. *Salesmen:* Joe Ballard, Vernon Powell. AREA SERVED — Kentucky, Southern Indiana.

LOUISIANA

HODGES THEATRE SUPPLY CO., INC., 1309 Cleveland Ave., New Orleans 13. Telephones: TUlane 8356—(Emergency Night) 21-4-3441, FAirview 8902, TUlane 1498. PERSONNEL—*President:* W. A. Hodges. *Manager:* Myrna Posey. *Salesmen:* Joe Faia, Paul German. *Sound Engineer & Salesman:* H. J. Ballam. AREA SERVED—Louisiana, Southern Mississippi, Southern Alabama, Northern Florida.

JOHNSON THEATRE SERVICE, 1409 Cleveland Ave., New Orleans 12. Telephones: RAymond 3562, FRanklin 5876-1571. PERSONNEL—George R. Johnson.

NATIONAL THEATRE SUPPLY, 220 S. Liberty St., New Orleans 13. Telephone: Raymond 4455. PERSONNEL—*Manager:* T. W. Neely. AREA SERVED—Louisiana, Alabama, Florida, Mississippi.

SOUTHEASTERN THEATRE EQUIP. CO. OF LOUISIANA, 214 S. Liberty St., New Orleans 13. *(See display listing on page 366.)*

*Listing not confirmed by Supply Dealer

SOUTHEASTERN THEATRE EQUIP. CO. OF LOUISIANA, 214 S. Liberty St., New Orleans 13. Telephone: TUlane 8661. PERSONNEL — *President and General Manager:* J. B. Dumestre, Jr. *Resident Manager:* W. H. Murphy, Jr. *Representatives:* Raymond Germillion, Don Wilmoth.



EVERYTHING for the Theatre!

Complete Sales and Service

• RCA PROJECTORS and LAMPS • RCA MOTOR GENERATOR SETS • RCA TUBE RECTIFIERS • RCA SOUND SYSTEMS • RCA SNOWHITE REGULAR and PLASTIC SOUND SCREENS • KOLLMORGEN LENS • INTERNATIONAL ALL STEEL CHAIRS • RCA THEATRE CARPETS and CARPET LINING • WESTINGHOUSE MAZDA LAMPS • NATIONAL CARBONS • THEATRE LIGHTING FIXTURES • *RCA THEATRE TELEVISION* and
Offering a complete architectural and engineering service on both new construction and remodelling.

Contact us for specially designed stage and house draperies.

ALON BOYD, P. O. Box 362, Shreveport. Telephones: 3-6101, 2-9488. AREA SERVED —Louisiana, Mississippi, Southwest Alabama.

MARYLAND

J. F. DUSMAN COMPANY, 12 East 25th St., Baltimore 18. Telephones: Belmont 5-2747-48—(Emergency Night) Clifton 4-0757. PERSONNEL—*Manager:* Henry C. Dusman. AREA SERVED—Maryland, District of Columbia, Virginia.

NATIONAL THEATRE SUPPLY, 417 St. Paul Place, Baltimore 2. Telephones: Mulberry 8266-67. PERSONNEL—*Manager:* N. C. Haefele. AREA SERVED — Maryland, District of Columbia, Virginia.

MASSACHUSETTS

AMERICAN THEATRE SUPPLY CO., 78 Broadway, Boston.

CAPITOL THEATRE SUPPLY CO., 28 Piedmont St., Boston 16. *(See display listing on this page.)*

INDEPENDENT THEATRE SUPPLY CO., INC., 28 Winchester St., Boston 16. Telephones: LIberty 0051 — (Emergency Night) Ken. 8995, Arl. 1693-W. PERSONNEL — *Manager:* E. K. Hosmer. *Salesman:* R. Quint. *Counter Man:* J. B. Devlin. AREA SERVED — Maine, New Hampshire, Vermont, Massachusetts, Rhode Island.

MASSACHUSETTS THEATRE EQUIPMENT CO., 20 Piedmont St., Boston 16. Telephones: LIberty 2-9814 — (Emergency Night) GRanite 2-7885, BElmont 5-2870-J. PERSONNEL—*Owner:* P. E. Comi. *Manager:* William J. Cliggot. *Sales and Installation:* P. E. Comi, Joseph Testa. AREA SERVED—All New England states.

CAPITOL THEATRE SUPPLY CO., 28 Piedmont St., Boston 16. Telephones: LIberty 2-6797 — (Emergency Night) WEllesley 5-2647, BLue Hills 8-6855. PArkway 7-0808W. PERSONNEL—*President:* K. R. (Ken) Douglass. *Vice-President:* K. R. Douglass, Jr. *Treasurer:* Frank Gray. *General Manager:* Ernest J. Comi. *Assistant Manager:* W. (Bill) Hawkins. *Salesmen:* Don Pickering, Don Falco, Ken Douglass, Jr., Charles Fish, Lou Phillips. AREA SERVED—Massachusetts, Connecticut, Rhode Island, Maine, Vermont, New Hampshire.



EVERYTHING for the Theatre!

Leading the Equipment Parade

• RCA PROJECTORS and LAMPHOUSES • RCA SOUND SYSTEMS and MAINTENANCE • HEYWOOD - WAKEFIELD CHAIRS • NATIONAL CARBONS • WESTINGHOUSE MAZDA LAMPS • MARQUEES • RCA THEATRE CARPETS • STAGE LIGHTING and DRAPERIES • GENERAL TICKET REGISTERS • TICKETS • RCA GENERATORS • WESTINGHOUSE and RCA RECTIFIERS • HOLMES PORTABLE PROJECTORS • WAGNER SIGNS and SILHOUETTE LETTERS • VALLEN CURTAIN CONTROLS and TRACKS • *RCA THEATRE TELEVISION.*

RCA DRIVE-IN THEATRE EQUIPMENT (The overwhelming choice of the nation's Drive-In Theatres)

*NATIONAL THEATRE SUPPLY, 37 Winchester St., Boston 16. Telephones: LIberty 2-2663 — (Emergency Night) EA 7-4362-W. PERSONNEL—*Manager:* H. J. McKinney. Lawrence Cooney, Louis A. Brown. AREA SERVED — New England States, except Connecticut.

THEATRE SERVICE & SUPPLY CO., INC., 18 Piedmont St., Boston 16. Telephone: LIberty 2-0356. PERSONNEL—*President and Treasurer:* P. Edward Comi. *Assistant Treasurer:* Mary Comi. *Repairman:* Joseph Testa. AREA SERVED—All New England States.

MICHIGAN

*AMUSEMENT SUPPLY CO., 208 W. Montcalm St., Detroit.

"ERNIE" FORBES THEATRE SUPPLY, 210-14 W. Montcalm St., Detroit 1. Telephones: WO. 1-1122-3—(Emergency Night) VE. 7-1227. PERSONNEL—*Owner:* Ernest H. Forbes. *Salesmen:* Howie T. Forbes, Ernest H. Forbes, Jr. AREA SERVED—Michigan.

*MacARTHUR THEATRE EQUIPMENT CO., 454 W. Columbia St., Detroit 1.

NATIONAL THEATRE SUPPLY, 2312 Cass Ave., Detroit 1. Telephones: WOodward 1-2447-8-9—(Emergency Night) Logan 5-4996, Kenwood 3-0447, Logan 3-2276. PERSONNEL — *Manager:* C. Williamson. *Salesmen:* Eugene Duffield, John I. Kenny. AREA SERVED—Michigan.

*UNITED THEATRE CAMERA & SUPPLY CO., INC., 2501 Cass at Henry, Detroit 1. Telephones: WOodward 2-6053-54. PERSONNEL—D. D. De Forge, L. E. Martin, A. F. Martin, G. E. Barge. AREA SERVED —Michigan.

*RINGOLD THEATRE EQUIPMENT CO., 106 Michigan St., N.W., Grand Rapids 2. Telephones: GL 4-8852—(Emergency Night) CH 3-2413. PERSONNEL — *Owner and Manager:* H. J. Ringold. AREA SERVED—Michigan.

MINNESOTA

NATIONAL EQUIP. CO., 7 E. Michigan St., Duluth 2. Telephone: 2-4567. PERSONNEL—James B. Enochs. AREA SERVED — Northeastern Minnesota, Northern Wisconsin.

*AVED THEATRE SERVICE, 830 Lumber Exchange Bldg., Minneapolis.

*ELLIOTT FILM & THEATRE EQUIPMENT CO., 1110 Nicollet Ave., Minneapolis.

FROSCH THEATRE SUPPLY, 1111 Currie Ave., Minneapolis 3. Telephone: Bridgeport 1166. PERSONNEL—*Owner:* M. E. Frosch. *Manager:* Henry Miller—Hy. 1753. AREA SERVED—Minnesota, North Dakota, South Dakota, Northern Iowa, Northern Wisconsin, Northern Michigan.

MINNEAPOLIS THEATRE SUPPLY, 75 Glenwood Ave., Minneapolis 3. Telephones: BRidgeport 3306—(Emergency Night) ALdrich 7586, DUpont 3936. PERSONNEL—*Co-Owners:* C. C. Creamer, R. C. Lahti, R. E. Lundquist. AREA SERVED—Minnesota, North and South Dakota, North-West Wisconsin.

NATIONAL THEATRE SUPPLY, 56 Glenwood Ave., Minneapolis 3. Telephones: Main 8273 — (Emergency Night) Walnut 4127. PERSONNEL—*Manager:* A. T. Crawmer. AREA SERVED — Minnesota, North Dakota, Western Wisconsin, Eastern South Dakota.

NORM MAINTENANCE, 1017 E. Franklin Ave., Minneapolis. Telephone: BR 4818.

WESTERN THEATRE EQUIPMENT EXCHANGE, 45 Glenwood Ave., Minneapolis 3. Telephones: Geneva 2066—(Emergency Night) Hyland 6933, Mohawk 9-9376. PERSONNEL — George Kopman, Herschel Kopman. AREA SERVED—Wisconsin, Minnesota, Iowa, North and South Dakota, Nebraska.

MISSOURI

*MISSOURI THEATRE SUPPLY CO., 115 W. 18th St., Kansas City 8. Telephones: BA 3070-1. PERSONNEL—*Owners:* Mrs. Maxine and J. Eldon Peek. *Manager:* L. J. Kimbriel. AREA SERVED—Kansas, Missouri, Iowa, Nebraska.

NATIONAL THEATRE SUPPLY. 223 W. 18th St., Kansas City 8. Telephones: HArrison 3256 — (Emergency Night) JAckson 8082. PERSONNEL — *Manager:* Arthur de Stefano. *Order Desk:* Carl Whitney. *Store Sales:* Mel Murray. *Representatives:* Robert E. Smith, Vern Babcock. AREA SERVED—Kansas, Western Missouri.

SHREVE THEATRE SUPPLY CO., 217 W. 18th St., Kansas City 8. Telephones: HArrison 7849, 4206—(Emergency Night) ARmour 0632, HArrison 2404.

* Listing not confirmed by Supply Dealer

STEBBINS THEATRE EQUIPMENT COMPANY, 1804 Wyandotte, Kansas City 8. Telephones: GRand 0134—(Emergency Night) DRexel 2791. PERSONNEL—*Manager:* C. H. Badger. *Sales:* C. P. Pearce, H. Naylor, J. J. Gillis. AREA SERVED—Kansas, Missouri, Oklahoma, Nebraska.

McCARTY THEATRE SUPPLY CO., 3330 Olive St., St. Louis 3.

NATIONAL THEATRE SUPPLY 3212 Olive St., St. Louis 3. Telephones: JE 1-6350-51.

ST. LOUIS THEATRE SUPPLY CO., 3310 Olive St., St. Louis 3. Telephones: Jefferson 7974-75—(Emergency Night and Holidays) COlfax 9230, EDwardsville 900. PERSONNEL—*Manager:* A. H. Hosier. *Office:* Joe Newsham, Lucille Richter. *Repairs:* Mac Bostelmann. AREA SERVED—Central and Southern Illinois, Kentucky, Eastern Missouri.

MONTANA

MONTANA THEATRE SUPPLY, 120 W. Front St., Missoula. Telephones: 9-8747—(Emergency Night) 2-2508. PERSONNEL—*Owner:* Robert Hutchins. *Office Manager:* Wm. Fowers, Jr. AREA SERVED—Montana, Idaho.

NEBRASKA

NATIONAL THEATRE SUPPLY, 1610 Davenport St., Omaha. Telephones:—(Emergency Night) Pleasant 5455, ATlantic 7366. PERSONNEL—*Manager:* Glenn K. Slipper. *Salesman:* Joe Moorhead. AREA SERVED—Nebraska, South Dakota, part of Iowa.

QUALITY THEATRE SUPPLY CO., INC., 1515 Davenport Street, Omaha 2. Telephones: At. 7253—(Emergency Night) Glendale 3902. PERSONNEL—*Owners:* Carl and Lynn White. *Manager:* Carl White. *Secretary:* Hazel White. *Salesman:* Wilbur Granville. *Counter Man:* Carl White, Jr. AREA SERVED—Nebraska, Western Iowa, Southern South Dakota.

THE WESTERN THEATRE SUPPLY CO., 214 N. 15th St., Omaha 2. Telephone: Atlantic 9046. PERSONNEL—*Owner:* Paul Fine. *Sales:* E. N. Epley. *Engineer:* H. Coyne. *Secretary:* Wanda Radik. AREA SERVED—Nebraska, Iowa, South Dakota, North Dakota, Missouri, Kansas.

NEW MEXICO

EASTERN NEW MEXICO THEATRE SUPPLY CO., Box 1099, Clovis. Telephones: Clovis 6615 — (Emergency Night) Clovis 7848. PERSONNEL—*Manager:* E. R. Hardwick. AREA SERVED — Eastern New Mexico, Panhandle of Texas.

NEW YORK

ALBANY THEATRE SUPPLY CO., 443 N. Pearl St., Albany 4. Telephones: 5-5055—(Emergency Night) 2-4309. PERSONNEL—*Owners:* John Bylancik, Jack McGrath. *Salesmen:* T. McGrath, E. Bylancik, J. Decker. *Manager:* Jack McGrath. *Counter:* A. Bonano. AREA SERVED—New York State, Vermont, Massachusetts

NATIONAL THEATRE SUPPLY, 962 Broadway, Albany 4. Telephones: 5-1479—(Emergency Night) Nassau 8-1796. PERSONNEL—*Manager:* Ralph J. Mauro *Salesman:* A. D. Hermans, Sr. *Secretary:* Doris B. McGrath. AREA SERVED—Central New York.

AUBURN THEATRE EQUIPMENT CO., 5 Court St., P. O. Box 112, Auburn. Telephones: 2-5141—(Emergency Night) 2-4313. PERSONNEL—*Owner:* F. W. Spreter. *Sales Manager:* C. A. Spreter. *Office Manager:* M. E. Dawson. *Salesman:* C. Conners. *Counter Man:* Earl Dean. AREA SERVED —New York State.

EASTERN THEATRE SUPPLY CO., INC., 496 Pearl St., Buffalo 2. *(See display listing below.)*

EASTERN THEATRE SUPPLY CO., INC., 496 Pearl St., Buffalo 2. Telephones: MOhawk 0001—(Emergency Night) WIndsor 2011, Victoria 3720, East Aurora 1213. PERSONNEL—*President and General Manager:* M. E. Pickrell. *Vice-President:* Louis S. Wolk. *Secretary-Treasurer:* Paul Wolk. *Manager:* John R. Chiarmonte. *Sales:* Al Becker. AREA SERVED—New York State—except New York City District.

RCA THEATRE SUPPLY DEALER

EVERYTHING for the Theatre!

SERVICE Before, During and After SALES

Dependable Consultation on Design - Engineering - Equipment

RCA — Service

• DRIVE-IN EQUIPMENT • SOUND EQUIPMENT • RCA PROJECTORS • RCA LAMPS • RECTIFIERS • SNOWWHITE SCREENS • RCA THEATRE CARPET and LINING • INTERNATIONAL CHAIRS • GENERATORS • LENSES • LAMPS • SPOTLIGHTS • STAGE DRAPES • CONTROLS • MATS • LOBBY FRAMES • MARQUEES • FRONTS • TICKET REGISTERS • TICKETS • CHANGEMAKERS • CARBONS • BLOWERS • CRON-O-MATIC CARBON SAVERS • EMERGENCY LIGHTING • *RCA THEATRE TELEVISION* • 3D and ALL TYPES MODERNIZING EQUIPMENT • CRETORS POPCORN MACHINES • CINEMASCOPE.

Complete Line of Supplies

NATIONAL THEATRE SUPPLY, 500 Pearl St., Buffalo 2. Telephones: Washington 1736-7 — (Emergency Night) University 4684, BE 2881, Bedford 4516. PERSONNEL—*Manager:* V. G. Sandford. *Salesman:* G. R. George. *Cashier:* Bertha Kreinik. AREA SERVED—Western New York State.

PERKINS THEATRE SUPPLY CO., 505 Pearl St., Buffalo. Telephones: Mohawk 3615—(Emergency Night) Plaza 6294. PERSONNEL—*Manager:* Carl E. Bell. AREA SERVED — Western New York State, Pennsylvania.

*AMUSEMENT SUPPLY CO., INC., 341 W. 44th St., New York 18. Telephones: CIrcle 6-0850—(Emergency Night) IN. 2-6691. PERSONNEL—*President:* Joseph J. Pear. *Salesmen:* Harry E. Pear, Henry Dieter. *Counter Man:* Seymour Rindner. AREA SERVED — Metropolitan Area, Northern New Jersey, Southern New York State.

CAPITOL MOTION PICTURE SUPPLY CORP., 630 Ninth Ave., New York 36. Telephone: PLaza 7-4510. PERSONNEL—*President:* Ben Perse. *Vice-President:* Harry Perse. *Sales Engineer:* Peter Braut. *Counter Men:* Sam Ochs, Peter Braut. AREA SERVED—Southern New York State, Pennsylvania, New Jersey, Ohio.

CINEMATOGRAPH INTERNATIONAL, INC., 630 Ninth Ave., New York 36. Telephones: CIrcle 6-6285—(Emergency Night) ESplanade 6-5698, HEmpstead 7-9034, SCarsdale 3-1623. PERSONNEL — *President:* George Hornstein. *Sales Engineer:* Jack Schaffer. *Salesmen:* Julian Norwick, G. Pinckney. *Service Engineers:* H. Schwartz, Joe Kelly. AREA SERVED—Entire World.

CROWN MOTION PICTURE SUPPLIES CORP., 354 W. 44th St., New York 18. PERSONNEL — *Owner:* Julius H. Katz, *President. Salesman:* Wallace J. Katz. AREA SERVED—New York, Northern New Jersey, Connecticut.

JOE HORNSTEIN, INC., 630 Ninth Ave., New York 36. *(See display listing below.)*

JOE HORNSTEIN, INC., 630 Ninth Ave., New York 36. Telephones: CIrcle 6-6285—(Emergency Night) ESplanade 6-5698, IVanhoe 9-9034, OLympia 9-7556, SCarsdale 3-1623. PERSONNEL—*Sales Manager:* George Hornstein. *Sales Engineer:* Jack Schaffer. *Salesmen:* George Hornstein, Julian Norwick. *Counter Man:* Claude Scott. *Service Men:* H. Schwartz, Joe Kelly. AREA SERVED—Eastern States.

EXCLUSIVE DISTRIBUTOR

MOTIOGRAPH

Complete Equipment for 3-D, Cinemascope Screens, Anamorphic Lenses, Stereophonic and Perspecta Sound, Wide Angle Lenses, Wide Angle Screen Frames, Motiograph HI-Power Generators, Ashcraft Super Power Lamphouses, Ashcraft Continuous Duty Rectifiers, Motiograph Strong Lamphouses, Knitron Rectifiers, Motiograph Strong Continuous Duty Rectifiers, Imperial Stedypower Generators, Ideal Chairs, Raytone Screens, National Carbons, ADC Curtain Controls, Wagner & Adler Letters, Sealuxe Aluminum Frames, Gulistan Theatre Carpets.

SOUND PROJECTORS ARC LAMPS and DRIVE-IN EQUIPMENT

Designed and built by specialists for over 50 years

See Complete Data on Pages 296 and 297 of this Volume.

SALES AND SERVICE BY EXPERTS!

NATIONAL THEATRE SUPPLY, 356 W. 44th St., New York 18. Telephone: CIrcle 5-6900. PERSONNEL — *Manager:* Allen G. Smith. *Sales Manager:* Bernard J. Kleid. *Special Sales Engineer:* William G. Nafash. AREA SERVED—Greater New York City, Southern New York, Northern New York.

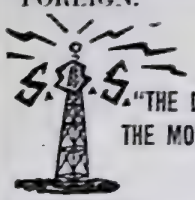
S.O.S. CINEMA SUPPLY CORP., 602 W. 52nd St., New York 19. *(See display listing on page 368.)*

NORTH CAROLINA

CHARLOTTE THEATRE SUPPLY, 227 S. Church St., Charlotte. Telephones: 3-9369, 6-1452 — (Emergency Night) 7-1210, 2-3527. PERSONNEL — *Manager:* F. M. Strange. *Sales Representatives:* Dick Douglas, Charles Duncan.

*Listing not confirmed by Supply Dealer

S.O.S. CINEMA SUPPLY CORP. 602 W. 52nd St., New York 19. Telephones: PLaza 7-0440 — (Emergency Night) LOngbeach 6-10044. PERSONNEL—*President:* J. A. Tanney, *Vice-President & Sales Manager:* O-ear Light-tone. *Vice-President & Showroom Sales:* Dominic Capano. *Production Manager:* William Allen. *Counter Man:* Joseph Miranda. AREA SERVED—Mail Order, entire U.S.A. and FOREIGN.



Since 1926

"THE DEPARTMENT STORE FOR THE MOTION PICTURE INDUSTRY"

- AMPLIFIERS
- ARC LAMPHOUSES
- BLOWERS & FANS
- CARBONS
- REFLECTORS
- COATED LENSES
- EFFECT MACHINES
- FILM CABINETS
- GENERATOR SETS
- POWER PLANTS
- LIGHTING EQUIPMENT
- PROJECTION EQUIPMENT

NEW & REBUILT

One Year Guarantee

"HEADQUARTERS FOR DRIVE-IN THEATRES"

Write to "DEPT. DY" for S. O. S. Catalog

● *ALSO—full line of Studio, Recording and Laboratory equipment.*

DIXIE THEATRE SUPPLY CO., 213 West 3rd St., Charlotte 1. Telephones: 2-4343 —(Emergency Night) 2-3039. PERSONNEL —*Owner:* J. B. Erskine. AREA SERVED—North and South Carolina.

HARRIS THEATRE SALES, INC., 321 S. Church St., Charlotte. Telephones: FR 5-0111 —(Emergency Night) ED 4-5915. PERSONNEL—*President and Treasurer:* W. F. Harris. *Vice-President and Secretary:* J. E. Harris. *Director:* V. E. Jordan. *S. Carolina Salesman:* Dean House. *N. Carolina Salesman:* Paul H. Cockrill. AREA SERVED—North and South Carolina.

NATIONAL THEATRE SUPPLY, 304 S. Church St., Charlotte 1. Telephones: 2-7753, 2-7754—(Emergency Night) 6-2850, 2-4402, 5-4970, 7-3100, 5-0397, 4-8372. PERSONNEL—*Manager:* R. D. Turnbull. *Salesmen:* A. R. Coskrey, C. G. Lawing, J. H. Dunphy. *Service Engineer:* D. K. Chastain. *Counter Men:* H. G. Gosey, T. C. Parris. *Cashier:* Mae D. Smith. *Secretary:* Joan Austin. AREA SERVED—North and South Carolina.

SOUTHEASTERN THEATRE EQUIP. CO. OF NORTH CAROLINA, 209 S. Poplar St., Charlotte 2. *(See display listing on this page.)*

STANDARD THEATRE SUPPLY CO., 219 S. Church St., Charlotte. *(See display listing on this page.)*

THEATRICAL ENGINEERING CO., 1411 Andover Road, Charlotte 7. Telephones: EDison 4-1623, EDison 2-7754.

THEATRE EQUIPMENT CO., 1220 E. 7th St., Charlotte. Telephones: 5-8481-2-3. PERSONNEL—*Manager:* R. C. Saunders. *Sound Engineer:* Lewis Saunders.

WIL-KIN THEATRE SUPPLY, INC., 229 South Church St., Charlotte 2. *(See display listing on this page.)*

* Listing not confirmed by Supply Dealer

SOUTHEASTERN THEATRE EQUIP. CO. OF NORTH CAROLINA, 209 S. Poplar St., Charlotte 2. Telephones: 4-3093-94—(Emergency Night) 4-1804, 3-1801. PERSONNEL—*President and General Manager:* J. B. Dumestre, Jr. *Assistant General Manager:* Fred Bearden, Jr. *Manager:* W. P. (Bill) White. *Representative:* William A. Hendry, Jr. AREA SERVED—North and South Carolina.

RCA THEATRE SUPPLY DEALER

EVERYTHING for the Theatre!

Complete Sales and Service

• RCA PROJECTORS and LAMPS • RCA MOTOR GENERATOR SETS • RCA TUBE RECTIFIERS • RCA SOUND SYSTEMS • RCA SNOWHITE REGULAR and PLASTIC SOUND SCREENS • KOLLMORGEN LENS • INTERNATIONAL ALL STEEL CHAIRS • RCA THEATRE CARPETS and CARPET LINING • U. S. AIRCO VENTILATING and REFRIGERATION • TYPHOON AIR CONDITIONING • WESTINGHOUSE MAZDA LAMPS • NATIONAL CARBONS • THEATRE LIGHTING FIXTURES • *RCA THEATRE TELEVISION*

and

Offering a complete architectural and engineering service on both new construction and remodelling.

Contact us for specially designed stage and house draperies.

STANDARD THEATRE SUPPLY CO., 219 S. Church St., Charlotte. Telephone: 5-6008. PERSONNEL—*Owner:* Phil Wicker. *Manager:* Dean Phillips. *Office Manager:* Panny Cobb. *Salesmen:* Ed Thompson, Henry Phillips. AREA SERVED—North and South Carolina, Southern Virginia. *(See listing for Greensboro store on this page.)*

AUTHORIZED DISTRIBUTOR for

Sales and Service on:

SOUTHERN Desk Chairs
STRONG Arcs and Rectifiers
IDEAL Theatre Seating
BAUSCH & LOMB Lenses
KOLLMORGEN Lenses
ALEX-SMITH Carpet
T.E.C.A. Speakers
CRETORS Popcorn Machines
STAR POPCORN and CONCESSION EQUIPMENT

Complete Drive-In Theatre Equipment

WORLD-WIDE Century DISTRIBUTION

PROJECTION and SOUND EQUIPMENT

A WORLD-WIDE REPUTATION for Top Quality and Dependability.

STANDARD THEATRE SUPPLY CO., 215 E. Washington St., Greensboro. Telephones: 2-6165, 2-6166 — (Emergency Night) 7281, 3-2128. PERSONNEL—*Owner:* Phil Wicker. *Manager:* Lawson Rankin. *Service Engineer:* J. W. Markham. *Salesmen:* Lloyd Parson, Kermit Clark, Jimmie Barham, Jerry Bolling. AREA SERVED — North and South Carolina, Southern Virginia.

*THEATRE SUPPLIERS, INC., 3101 High Point Rd., Greensboro. PERSONNEL—*Secretary-Treasurer:* R. O. Holland. *Vice President and Service Manager:* Ed Harrison. AREA SERVED—North and South Carolina, Lower Virginia.

WIL-KIN THEATRE SUPPLY, INC., 229 South Church St., Charlotte 2. Telephone: EDison 3-6101. PERSONNEL—*Branch Manager:* J. C. Tipton. *General Sales Manager:* C. W. Fortson. *General Manager:* Nash Weil. AREA SERVED — North Carolina, South Carolina.

EXCLUSIVE DISTRIBUTOR

MOTIOGRAPH

- CYCLORAMIC Screen
- ASHCRAFT Lamphouses and Rectifiers
- HEYWOOD-WAKEFIELD Chairs
- IMPERIAL MOTOR Generator Sets
- AUTOMATIC DEVICES Curtain Tracks and Controls
- ADLER Silhouette Sign Letters
- CRETORS Popcorn Machines

We maintain Projection and Sound Equipment Repair Shops and our own Drapery Shop.

"Everything for the Theatre Except Film"

SOUND PROJECTORS and DRIVE-IN EQUIPMENT

Designed and built by specialists for over 50 years

See Complete Data on Pages 296 and 297 of this Volume.

SALES AND SERVICE BY EXPERTS!

NORTH DAKOTA

*McCARTHY THEATRE SUPPLY CO. 67 N. 4th St., Box 32, Fargo.

OHIO

AKRON THEATRE SUPPLY CO., 120 E. Market St., Akron 8. Telephone: FRanklin 6-2480. PERSONNEL—*President:* Harry P. Jones. *Secretary-Treasurer:* Allan R. Benson. AREA SERVED—Northern Ohio, Western Pennsylvania.

*CINCINNATI THEATRE SUPPLY CO., INC., 3601 Epworth Ave., Cincinnati. PERSONNEL—*President:* Louis Wetzel. *Secretary:* Carl Reif.

*MID-WEST THEATRE SUPPLY CO., INC,. 1638 Central Parkway, Cincinnati 10. Telephones: CHerry 7724-25 (24 hour service). PERSONNEL — *Owners:* H. B. Snook, *President;* T. M. Fisher, *Secretary-Treasurer. Salesmen:* R. H. Stimpert, H. N. Schoo. AREA SERVED — Southern Ohio, Kentucky, Southern West Virginia.

NATIONAL THEATRE SUPPLY, 1637 Central Parkway, Cincinnati 14. Telephones: Main 6580-81. PERSONNEL — James A. Conn, E. C. Novak, Fred Barthel, Ruth Wagner, F. M. Conn. AREA SERVED — Southern Ohio, West Virginia, Kentucky.

*CLEVELAND PROJECTOR CO., 726 Film Building, 2108 Payne Ave., Cleveland 14. Telephone: Main 6286.

NATIONAL THEATRE SUPPLY, 2128 Payne Ave., Cleveland 14. Telephones: PRospect 1-4613-4—(Emergency Night) Longacre 1-7608. PERSONNEL—*Manager:* Frank J. Masek. *Salesman:* Miles Mutchler. *Counter Man:* Robert Ullman. AREA SERVED—Northern Ohio.

OHIO THEATRE SUPPLY CO., 2108 Payne Ave., Cleveland 14. Telephones: PRospect 1-6545-46 — (Emergency Night) EVergreen 1-0376. PERSONNEL — *Owner:* Ben L. Ogron. AREA SERVED—Cleveland Exchange Territory.

OLIVER THEATRE SUPPLY CO., INC., E. 23rd & Payne Ave., Cleveland 14. Telephones: TOwer 1-6934-35 — (Emergency Night) ACademy 1-5362. PERSONNEL—*Manager:* M. H. Fritchle. *Salesman:* Nick Lubich. *Office Manager:* Mrs. Helen Albertson. AREA SERVED — Northern Half of Ohio.

DAYTON THEATRE SUPPLY CO., 111 Volkenand St., Dayton 10. Telephone: Kenmore 5821. PERSONNEL—*Owner and Manager:* Charlie D. Wall. AREA SERVED—Southwest Ohio, Eastern Kentucky.

*AMERICAN THEATRE SUPPLY CO., 439 Dorr St., Toledo 2. Telephones: MAin 1830 —(Emergency Night) LAwndale 5666. PERSONNEL—Paul S. Hueter.

THEATRE EQUIPMENT CO., 1206 Cherry St., Toledo 4. Telephones: ADams 8107-8. PERSONNEL—*Owner:* Al Boudouris. *Sales Representatives:* James Bryant, O. Wells. AREA SERVED—Ohio, Indiana, Michigan.

OKLAHOMA

CENTURY THEATRE SUPPLY CO., 706 W. Grand, Ave., Oklahoma City. Telephones: RE 6-8709—(Emergency Night) JA 5-6619, JA 8-8796. PERSONNEL—*Owner:* Byron Savage. *Office Manager:* W. S. Quade. AREA SERVED—Oklahoma, Texas Panhandle.

W. R. HOWELL, 12 S. Walker St., Oklahoma City 4.

NATIONAL THEATRE SUPPLY, 700 W. Grand Ave., Oklahoma City 2. Telephones: CE 2-0203—(Emergency Night) JA 8-2476, JA 4-0394, JA 8-7085. PERSONNEL—*Manager:* J. I. Watkins. *Salesmen:* Howard Nelson, Mike Baldrid. AREA SERVED—Oklahoma and Panhandle of Texas.

OKLAHOMA THEATRE SUPPLY CO., 623 W. Grand Ave., Oklahoma City 2. Telephones: REgent 6-8691—(Emergency Night) JA 8-7820. PERSONNEL—*Owners:* J. Eldon Peek and Maxine Peek. *Counter Man:* M. F. Bailey. AREA SERVED—Oklahoma, Panhandle District of Texas, Western Arkansas.

OREGON

MODERN THEATRE SUPPLY, INC., 1935 N.W. Kearney, Portland. Telephones: CApitol 6437—(Emergency Night) BLackstone 1-1613. PERSONNEL—*Manager:* John D. Peterson. *Salesman:* Dave Dimick. AREA SERVED — Oregon, Washington, Idaho, Montana, Alaska.

*PORTLAND MOVING PICTURE MACHINE CO., 916 N. W. 19th Ave., Portland 9. Telephone: CApitol 4367. PERSONNEL —*Owner:* Pete Sabo. *Salesman:* V. L. Beck. AREA SERVED—Oregon, Southern Washington.

B. F. SHEARER CO., 1947 N. W. Kearney St., Portland 9. Telephones: ATwater 7543—(Emergency Night) VErmont 1274. PERSONNEL—*Branch Manager:* E. C. Holland. *Counter Man:* Dan Stitt. AREA SERVED—Oregon, Southern Idaho.

INTER-STATE THEATRE EQUIPMENT CO., 1923 N.W., Kearney St., Portland 9. Telephone: BEacon 7800. AREA SERVED—Oregon, Washington, Idaho, Montana.

PENNSYLVANIA

PERKINS THEATRE SUPPLY CO., Box 87, Danville. Telephone: 996W. PERSONNEL—*Salesman:* Harold E. Bell. AREA SERVED — Pennsylvania, Western New York State.

VINCENT M. TATE THEATRE EQUIPMENT, 1618-20 Wyoming Ave., Forty-Fort, Wilkes-Barre. *(See display listing below.)*

VINCENT M. TATE THEATRE EQUIPMENT, 1618-20 Wyoming Ave., Forty-Fort, Wilkes-Barre. Telephone: Wilkes-Barre 7-2096. PERSONNEL—*Owner:* Vincent M. Tate. *Shop and Store:* Norman Saunders. AREA SERVED—Phila. Film Territory.

EXCLUSIVE DISTRIBUTOR

MOTIOGRAPH

SOUND PROJECTORS

and DRIVE-IN EQUIPMENT

Designed and built by specialists for over 50 years

IDEAL CHAIRS

Strong Lamps and Products

Ashcraft Lamps

DRIVE-IN SPECIALIST

COMPLETE ENGINEERING and EQUIPMENT

EVERYTHING FOR THE THEATRE

See Complete Data on Pages 296 and 297 of this Volume.

SALES AND SERVICE BY EXPERTS!

BLUMBERG BROS., INC., 1305-07 Vine St., Philadelphia 7. *(See display listing on this page.)*

NATIONAL THEATRE SUPPLY, 1225 Vine St., Philadelphia 7. Telephones: LOcust 7-6156-7—(Emergency Night) GReenwood 3-7678. PERSONNEL—*Manager:* William J. Hutchins. *Salesmen:* Mickey Lewis, Stan Lechmer, Bud Miller. *Counter Man:* George Lewis. *Shop Mechanic:* Ed Humphries. AREA SERVED—Eastern Pennsylvania, Delaware, Southern New Jersey.

SUPERIOR THEATRE EQUIPMENT CO., 1315 Vine St., Philadelphia 7. Telephones: LOmbard 3-9020—(Emergency Night) BA 2-8320, WElsh Valley 4-0589. PERSONNEL —Joseph Engel, Harry Brillman.

ALEXANDER THEATRE SUPPLY, INC., 84 Van Braam St., Pittsburgh 19. *(See display listing on this page.)*

ATLAS THEATRE SUPPLY CO., 402 Miltenberger St., Pittsburgh 19. Telephones: GRant 1-4281 — (Emergency Night) PE. 1-6330. PERSONNEL—*President and Manager:* Gordon O. Gibson. *Salesman:* James M. Gibson. AREA SERVED — Pittsburgh Film Territory.

BLUMBERG BROS., INC., 1305-07 Vine St., Philadelphia 7. Telephones: LOmbard 3-7240-41 — (Emergency Night) Welsh Valley 4-4920 or 4-5368. PERSONNEL — *President:* Harry Blumberg. *Secretary and Treasurer:* Ben Blumberg. *Service Men:* Joe Haggerty (Nite Phone — GReenwood 3-9207), Leon Miller (Nite Phone — TRinity 7-1898), Irv Goldeberg (Nite Phone — GReenwood 3-7171). AREA SERVED — Pennsylvania, Delaware, New Jersey.

RCA THEATRE SUPPLY DEALER

EVERYTHING for the Theatre!

Distributors for:

• RCA PROJECTORS • RCA SOUND SYSTEMS • INTERNATIONAL CHAIRS • RCA TUBE RECTIFIERS • RCA GENERATORS • RCA THEATRE CARPETS • RCA SCREENS • WESTINGHOUSE LAMPS • DRIVE-IN EQUIPMENT • RCA ARC LAMPS • WESTINGHOUSE COPPER OXIDE RECTIFIERS • RCA SPEAKER SYSTEMS • *RCA THEATRE TELEVISION.*

ALEXANDER THEATRE SUPPLY, INC., 84 Van Braam St., Pittsburgh 19. Telephones: (Day and Night) EXpress 1-0777-78. PERSONNEL — *President:* T. F. McCleary. *Vice President:* S. A. Fineberg. *Secretary and Treasurer:* James H. Alexander. *Sales:* H. D. Putnam, Edw. Chorle. *Secretary:* Rosa Eardley. AREA SERVED—Western Pennsylvania and Northern West Virginia.

RCA THEATRE SUPPLY DEALER

EVERYTHING for the Theatre!

Complete Sales and Service on:

• RCA SOUND SYSTEMS • RCA PROJECTORS • RCA ARC LAMPS • RCA DYNALITE SCREENS • RCA TUBE RECTIFIERS • RCA THEATRE CARPETS • INTERNATIONAL CHAIRS • WESTINGHOUSE LAMPS • GENERAL REGISTER TICKET MACHINES • PREMIER-SOUTHERN TICKETS • JOHNSON'S LIGHTNING CASHIERS BAUSCH AND LOMB and KOLLMORGEN LENSES • GOLDE also GOLDBERG ELECTRIC REWINDERS • NEUMADE FILM CABINETS • ROYALCHROME FURNITURE • NATIONAL CARBONS • AIR CONDITIONING • STAGE DRAPERIES and DECORATIONS • *RCA THEATRE TELEVISION* • GLOBE TICKETS.

RCA DRIVE-IN THEATRE EQUIPMENT (The overwhelming choice of the nation's Drive-In Theatres)

*NATIONAL THEATRE SUPPLY, 1721 Blvd. of the Allies, Pittsburgh 19. Telephone: GRant 1-4630. PERSONNEL—*Manager:* N. F. Williams. *Salesmen:* H. W. Russell, P. E. Baracca. AREA SERVED—Western Pennsylvania, Northern West Virginia.

• Listing not confirmed by Supply Dealer

RHODE ISLAND

*RHODE ISLAND THEATRE SUPPLY CO., 357 Westminster St., Providence.

SOUTH CAROLINA

*ACE CAMERA SUPPLY, 150 N. Irvy St., Florence.

*TRIO AMUSEMENT CO., 229 North Main St., Box 394, Greenville. Telephones: 2-7111, 2-7401 — (Emergency Night) 3-2193. PERSONNEL — *Owner and Manager:* Ed C. Curdts. *General Manager:* Fred S. Curdts. AREA SERVED — South Carolina, North Carolina.

SOUTH DAKOTA

AMERICAN THEATRE SUPPLY, 316 S. Main Ave., Sioux Falls. Telephones: 2-1851, 2-9072. PERSONNEL—*Owner and Manager:* A. E. Trotzig. *Service Engineer:* E. Robbins. AREA SERVED—South Dakota, Southwestern Minnesota, Northwestern Iowa.

TENNESSEE

MONARCH THEATRE SUPPLY, INC., 492 S. Second St., Memphis 2. *(See display listing below.)*

MONARCH THEATRE SUPPLY, INC., 492 S. Second St., Memphis 2. Telephone: 37-4584—(Night and Sunday 36-7943, 36-2449. PERSONNEL—*President:* N. B. Blount. *Manager:* L. A. Mitchell, Sr. AREA SERVED—Tennessee, Arkansas, Mississippi.

RCA THEATRE SUPPLY DEALER

EVERYTHING for the Theatre!

Sales and Service on:

• RCA PROJECTORS • RCA SOUND SYSTEMS • RCA ARC LAMPS • RCA SCREENS • GENERAL ELECTRIC LAMPS • RCA RECTIFIERS • INTERNATIONAL CHAIRS • RCA THEATRE CARPETS • RCA GENERATORS • DRIVE-IN EQUIPMENT • RCA SPEAKER SYSTEMS • SEALUXE POSTER CASES • *RCA STEREOPHONIC SOUND.*

NATIONAL THEATRE SUPPLY, 412-414 S. 2nd St., Memphis 2. Telephones: 5-6616-17—(Emergency Night) 2-8843, 4-2754, 36-3066, 39-1330. PERSONNEL — *Vice-President:* R. L. Bostick. *Branch Manager:* C. C. Bach. *Salesmen:* C. E. Summer, C. E. Matthews. *Service Engineer and Salesman:* O. D. Bland. *Counter Salesmen:* W. R. Bell, R. W. Lane. AREA SERVED — Western Tennessee, Arkansas, Northern Mississippi, Southeastern Missouri.

THEATRE & EXHIBITORS SUPPLY CO., 361 S. Second St., Memphis. Telephones: 5-8214—(Emergency Night) 34-1291. PERSONNEL—Kenneth E. Forster. AREA SERVED—Memphis Exchange Area.

TRI-STATE THEATRE SUPPLY CO., 320 S. Second St., Memphis 3. *(See display listing below.)*

TRI-STATE THEATRE SUPPLY CO., 320 S. Second St., Memphis 3. Telephones: 5-8249, 5-8240—(Emergency Night) 4-5269, 62-2419. PERSONNEL—*Owners:* Robert F. Blank, G. L. Mitchell. *Salesman:* John Thompson. AREA SERVED—Arkansas, Northern Mississippi, Western Tennessee.

AUTHORIZED DISTRIBUTOR for

WORLD-WIDE Century DISTRIBUTION

Complete line of Equipment for:

Conventional and Drive-In Theatre

Complete Theatre Decorating—Drapes

Exclusive Distributors for the LORRAINE Carbons in the above territory.

PROJECTION and SOUND EQUIPMENT

A WORLD-WIDE REPUTATION for Top Quality and Dependability.

TEXAS

HARDIN THEATRE SUPPLY CO., 714 S. Hampton Road, Dallas 11. *(See display listing below.)*

HARDIN THEATRE SUPPLY CO., 714 S. Hampton Road, Dallas 11. Telephones: Woodlawn 2235-2232 (24 hour service.) PERSONNEL—*Owner:* J. H. Hardin. *Office Manager:* Paul W. Humphries. *Salesmen:* Otto Akin, Joe Joseph. AREA SERVED—Texas, New Mexico, Oklahoma, Louisiana, Arkansas.

AUTHORIZED DISTRIBUTOR for

WORLD-WIDE Century DISTRIBUTION

STRONG Lamps

SNAPLITE Lenses

VOCALITE Screens

REBUILT Theatre Equipment

PROJECTION and SOUND EQUIPMENT

A WORLD-WIDE REPUTATION for Top Quality and Dependability.

* Listing not confirmed by Supply Dealer

HERBER BROS., 408 S. Harwood St., Dallas 1. Telephone: RI 3553. PERSONNEL—*Partners:* E. P. and B. G. Herber. *Shop Foreman:* D. O. Hulse. AREA SERVED—Texas, Louisiana, Oklahoma, New Mexico, and part of Mexico.

MODERN THEATRE EQUIPMENT CO., 1916 Jackson St., Dallas. *(See display listing below.)*

MODERN THEATRE EQUIPMENT CO., 1916 Jackson St., Dallas. Telephones: Riverside 5009, Randolph 6361—(Emergency Night) Woodlawn 2547. PERSONNEL—*Owner:* H. S. Sorenson: AREA SERVED—Texas.

EXCLUSIVE DISTRIBUTOR

MOTIOGRAPH

SOUND PROJECTORS ARC LAMPS and DRIVE-IN EQUIPMENT

Designed and built by specialists for over 50 years

MOTIOGRAPH and STRONG Projection Arc Lamps
MOTIOGRAPH and IMPERIAL Motor Generators
IRWIN Seating Company Chairs
U. S. AIRCO Cooling Equipment
LEEDOM and MOHAWK Carpets
UNIVERSAL Frames
WAGNER Marquees
NATIONAL Carbons

And a Complete Line of Supplies

See Complete Data on Pages 296 and 297 of this Volume.

SALES AND SERVICE BY EXPERTS!

NATIONAL THEATRE SUPPLY, 300 S. Harwood St., Dallas 1. Telephone: Sterling 2135-36. PERSONNEL—*Manager:* F. R. Hansen. *Assistant Manager:* S. M. Berry. *Salesmen:* H. A. Moore, W. T. Strother. *Office Manager:* E. H. Cernosek. *Counter Clerks:* V. P. Lysek, W. R. (Joe) Rainey. *Shipper:* Don M .Bonning. *Repair Dept.:* L. H. Walters. AREA SERVED—Texas.

EL PASO THEATRE EQUIPMENT CO., 7522 Monterey Drive, El Paso. Telephone: Prospect 2-0189 (Day and Night). PERSONNEL—*Owner:* M. Joe Birdwell. *Secretary:* Rosalind Birdwell. AREA SERVED—West Texas, New Mexico, Arizona, Mexico.

SOUTHWESTERN THEATRE EQUIPMENT CO., 1622 Austin Street, Houston 3. Telephone: Capitol 9906. 2010 Jackson Street, Dallas 1. Telephone: Prospect 73571. PERSONNEL — *Owners:* A. Mortensen, George Heck, J. W. Hill. *Dallas Manager:* J. O. Hill. *Houston Manager:* Alex McKinzie. AREA SERVED—Texas.

INDEPENDENT THEATRE SUPPLY, 2750 E. Houston, San Antonio 2. Telephone: Capitol 6-3508 (Day or Night)—PERSONNEL—*Owner and Manager:* R. W. Barron. *Secretary:* Mrs. R. A. Barron. *Saleswoman:* Mrs. Fred Mesch. *Mechanic:* Jack Vandevere. AREA SERVED—Texas.

UTAH

*INTER-MOUNTAIN THEATRE SUPPLY CO., 264 E. First South St., Salt Lake City 1. Telephone: 4-7821. PERSONNEL—*Manager:* Philip S. Guss. *Office Manager:* Chas. H. Lloyd. *Purchasing:* Ray Miller. *Shop Foreman:* L. Gerber. *Shipping:* Eddie Harrison.

SERVICE THEATRE SUPPLY CO., 256 E. First South St., Salt Lake City 1. Telephones: 5-1223 — (Emergency Night) Salt Lake 5-6990, Salt Lake 8-5358, Bountiful 374-W PERSONNEL — *President:* A. C. Knox. *Vice-President:* J. H. Swonson. *Secretary and Treasurer:* J. A. Bugger. *Installation:* J. A. Bugger, Edward Golden. *Shipping:* Ken Jones. *Sales and Service:* J. H. Swonson, J. A. Bugger. *Secretary:* Barbara Foote. *Accounting:* Spencer Searcy. AREA SERVED — Salt Lake Film Exchange Territory.

*WESTERN SOUND & EQUIPMENT CO., 26› East First South St., Salt Lake City. Telephones: 3-9974 — (Emergency Night) 6-1532. PERSONNEL — *President:* Ted Lewis. *Vice-President:* Ned Fuller. AREA SERVED — Utah, Idaho, Western Wyoming, Eastern Nevada.

VIRGINIA

NORFOLK THEATRE SUPPLY CO., 2706 Colley Ave., Norfolk 8. Telephones: 5-3818 (Emergency Night) 5-1744, 3-5337. PERSONNEL — *Owner:* Morris Ornoff. *Office Manager:* Jerry Ornoff. *Bookkeeper:* Renee Ornoff.

*PERDUE CINEMA SERVICE, 36 Kirk Avenue S.W., Roanoke. Telephones: 2-8817 — (Emergency Night) 4-2789. PERSONNEL —*Manager:* Roscoe E. Perdue. *Salesmen:* Doug Fleming, Nat Tanner. AREA SERVED —Western Virginia.

WASHINGTON

AMERICAN THEATRE SUPPLY CO., INC., 2300 - 1st Ave. at Bell St., Seattle 1. Telephones: SEneca 4572, VErmont 6662. PERSONNEL — *President:* R. E. W. Fairleigh. *Treasurer:* A. L. Hansen. *Sales Manager:* Richard Fairleigh. AREA SERVED — Pacific Northwest and California.

MODERN THEATRE SUPPLY, INC., 2400-3rd Ave., Seattle 1. Telephones: SEneca 2515 —(Emergency Night) Alder 1007, Kenwood 7823, Alder 4805, Sunset 4220. PERSONNEL —*Manager:* S. F. Burns. *Salesmen:* Lee W. Scott, Jack Barber, Don Farnham. AREA SERVED — Washington, Oregon, Montana, Idaho, Alaska.

NATIONAL THEATRE SUPPLY, 2319 2nd Ave., Seattle 1. Telephones: MAin 3421-3422—(Emergency Night) PLaza 5743, SUnset 8888. PERSONNEL—*Manager:* Harry L. Plunkett. *Salesmen:* Cecil Thompson, William Stahl, John Riley. *Purchasing Agent:* J. A. (Dutch) Trammell. AREA SERVED — Washington, Oregon, Montana, Idaho, Alaska.

B. F. SHEARER COMPANY, 2318 2nd Ave., Seattle 1. Telephones: ELiot 8247—(Emergency Night) EMerson 0088, ALder 6389, VErmont 1421, LOgan 5439. PERSONNEL — *Vice President and Manager:* T. L. Shearer. *Salesmen:* R. A. Brobeck, C. H. Beresford, F. T. Lay, Dan E. McGill, B. F. Shearer, Jr., B. R. Doud, P. W. Blake. AREA SERVED—Montana, Washington, Panhandle of Idaho, Territory of Alaska.

WEST VIRGINIA

CHARLESTON THEATRE SUPPLY CO., 506 Lee St., Charleston 21 Telephones: 34-413 — (Emergency Night) 21-045. PERSONNEL—*Owner and Manager:* N E. Merhie. *Salesman:* Albert E. Merhie.

LITTLE MACHINE CO., INC., 1114 Central Ave., Charleston 2.

LOVETT & CO., 333 W. Pike St., Clarksburg. Telephones: Clarksburg 2-2611—(Emergency Night) 4-5931. PERSONNEL—*General Manager:* D. E. Lovett. *Sales Representative:* Gray Barker. *Office Manager:* Virginia Howell. *Service Dept.:* Harry Carper. *Mascot:* "Maisie." AREA SERVED—West Virginia, Virginia, Maryland, Pennsylvania.

VETERANS ELECTRICAL CONSTRUCTION & SERVICE, INC., Randolph Ave. at 3rd St., Elkins. Telephones: 832—(Emergency Night) 1543W. PERSONNEL—*Manager, Theatre Equip. Sales:* Paul J. Zofsak. AREA SERVED — West Virginia, Western Virginia, Western Maryland.

*THEATRE SERVICE & SUPPLY CO., 1019 Tenth St., Huntington.

WISCONSIN

VIC MANHARDT CO., INC., 1705 W. Clybourn St., Milwaukee 3. Telephones: DIvision 2-8344-45 — (Emergency Night) Bluemond 8-4935. HIlltop 5-0415. PERSONNEL —*President:* Victor R. Manhardt. *Salesmen:* Richard V. Manhardt, Elmer J. Engel. AREA SERVED—Milwaukee Film Territory, Northern Wisconsin, Upper Michigan.

NATIONAL THEATRE SUPPLY. 1027 N. 8th St., Milwaukee 3. Telephones: BRoadway 1-7333 — (Emergency Night) Hilltop 5-7479, Division 2-8184, Lincoln 3-2405. PERSONNEL—*Manager:* A. J. Larsen. *Office Manager:* M. Anacker. *Serviceman:* F. J. Wagner. AREA SERVED—Milwaukee Exchange Territory, Upper Michigan.

*THE RAY SMITH COMPANY, 710 W. State St., Milwaukee 3. Telephones: BRoadway 1-2100—(Emergency Night) FRanklin 4-3744. BRoadway 6-0579. PERSONNEL — *Owner:* Ray A. Smith. *Office Manager:* Jerome P. Kurz. *Service Man:* Alex Zsebe. AREA SERVED — Wisconsin, Northern Michigan.

THEATRE EQUIPMENT & SUPPLY CO., 1009 N. 7th St., Milwaukee 3. Telephones: BRoadway 6-0123—(Emergency Night) EDgewood 2-4686. PERSONNEL — *Manager:* H. R. Vogel. AREA SERVED—Wisconsin, Upper Peninsula of Michigan.

STAR THEATRE SUPPLY CO., 36 N. Cascade St., Osceola. PERSONNEL—*Manager:* Emil A. Nelson.

Supply Dealers of the Dominion of Canada

Comprehensive Listing of Names, Addresses, Personnel, Products, and the Areas Served

ALBERTA

*DOMINION SOUND EQUIPMENTS, LTD., 712 8th Ave., W., Calgary. Telephone: 29947. PERSONNEL — *Manager:* W. F. Graham. *Theatre Equip. Sales and Service:* R. E. Gordon. *Sound Systems Equip. Sales:* R. K. Peck. *Acoustical Sales:* R. L. Gale. AREA SERVED—Alberta.

SHARP'S THEATRE SUPPLIES, LTD., Film Exchange Bldg., Calgary. Telephones: 2‘076, 27266 — (Emergency Night) 30757, 83246. PERSONNEL — *Manager:* W. G. *Sharp. Service Engineer:* A. E. Sick. *Salesman:* D. N. Rhodes. AREA SERVED — Alberta, Saskatchewan, Eastern British Columbia.

M. L. ADAMSON, 9921 - 113th St., Edmonton.

DOMINION SOUND EQUIPMENTS, LTD., 10330 - 104th St., Edmonton. Telephone: 42511. PERSONNEL—*Acoustical Sales:* A. T. Linden. *Theatre Equip. Sales and Service:* R. F. Downing. AREA SERVED—Alberta and Eastern British Columbia.

J. M. RICE & CO., LTD., 10911 - 116th St., Edmonton. PERSONNEL—*Manager:* Edwin Haugen. AREA SERVED — Alberta and Western Saskatchewan.

BRITISH COLUMBIA

DOMINION SOUND EQUIPMENTS LTD., 820 Cambie St., Vancouver. Telephones: Ma. 2181-82—(Emergency Night) Pa. 4231. PERSONNEL—*District Manager:* L. G. Sigurdson. *Engineer:* R. H. Williams. *Salesman:* R. C. Benton. AREA SERVED — British Columbia, Vancouver Island.

DOMINION THEATRE EQUIPMENT CO., Ltd., 847 Davie St., Vancouver. Telephones: Ma. 6634 (Emergency Night) Cherry 1298. PERSONNEL — *President:* D. V. K. Fairleigh. *Sales Manager:* C. M. Rae. *Counter Man:* G. A. Simmons. AREA SERVED—All of Canada.

GENERAL THEATRE SUPPLY CO., LTD., 914-16 Davie Street, Vancouver Telephones: MArine 7933, MArine 5449. PERSONNEL— *Branch Manager:* W. "Bill" Forward. *Service Engineers:* Ray Townsend, Ed Graham. *Counter:* D. Graham, W. McLean. AREA SERVED—British Columbia, Yukon Territory.

H. I. HOWARD THEATRE EQUIP. & SUPPLY CO., 906 Davie St., Vancouver.

* Listing not confirmed by Supply Dealer

Ashcraft Arc Lamps
Strong Arc Lamps and Rectifiers

Altec-Lansing "Voice of the Theatre"
Northern Electric Stereophonic Sound
Super Panatar Lenses
Astrolite Screens

Century Projectors
Imperial and Motiograph Generators
Auditorium Chairs

DOMINION SOUND EQUIPMENTS LIMITED SERVICE AND COMPLETE THEATRE SUPPLIES FROM COAST TO COAST

LA SALLE RECREATIONS, LTD. (Theatre Chair, Carpet & Linoleum Div.), 945 Granville St., Vancouver. Telephones: MA 5034, MA 5428—(Emergency Night) CE. 3929. PERSONNEL—*President and Managing Director:* S. A. Lechtzier. *Vice-President:* M. R. Lechtzier. AREA SERVED — Entire Dominion of Canada.

PERKINS ELECTRIC CO., LTD., 839 Davie St., Vancouver 1. Telephone: Tatlow 7633. PERSONNEL — *Branch Manager:* S. G. Wilson. *Service:* F. Robson. *Office:* I. Davis.

THEATRE EQUIPMENT SUPPLY CO., 906 Davie St., Vancouver. Telephones: MArine 7033—(Emergency Night) KE 3427R. PERSONNEL—*Owner:* H. I. Howard. *Sales and Service:* Bob Holm. *Counter Man:* E. R. Petch. AREA SERVED—British Columbia, Alberta, Yukon.

MANITOBA

DOMINION SOUND EQUIPMENTS LTD., 218-222 Fort St., Winnipeg. Telephone: 923-529. PERSONNEL—*District Manager:* R. R. Huston. *Sales and Service:* W. M. Tulloch, J. J. Zagol, E. P. Harrison, D. A. Phillips. *Acoustical Sales:* G. R. Steffens. AREA SERVED—Western Ontario, Manitoba, Saskatchewan.

GENERAL THEATRE SUPPLY CO., LTD., 271 Edmonton St., Winnipeg. Telephone: 92-5795. PERSONNEL — *Branch Manager:* Charles Maybee. *Sound Engineers:* H. B. Grimes, V. Lawrick. *Alberta Rep.:* R. Townsend. AREA SERVED—Manitoba, Saskatchewan, Alberta, Northern Ontario.

J. M. RICE & CO., LTD., 202A Canada Bldg., Winnipeg. Telephones: 935486-7 — (Emergency Night) 64437. PERSONNEL—*Owner:* J. M. Rice. *Manager:* J. L. Rice. *Salesman:* Howard E. Kinnear. *Counter Man:* Charles Carphin. AREA SERVED—Manitoba, Saskatchewan, Alberta, Western Ontario.

NEW BRUNSWICK

*PERKINS ELECTRIC CO., LTD., 164 Leslie Ave., Moncton. Telephone: 2-3239. *Manager:* Hector Beaulieu. AREA SERVED —Maritime Provinces and Newfoundland.

DOMINION SOUND EQUIPMENTS LTD., 4 Hazen Ave., Saint John. Telephones: 3-3031 —(Emergency Night) 3-7327. PERSONNEL —*Manager:* J. E. Tagg. *Service Engineer:* F. Burdon. *Salesman:* C. L. Johnston. AREA SERVED—New Brunswick.

* Listing not confirmed by Supply Dealer

GENERAL THEATRE SUPPLY CO., LTD., 86 Charlotte St., Saint John. Telephone: 3-2819. PERSONNEL — *Branch Manager:* Duncan H. McDonald. *Office:* Thomas H. Dare. *District Engineers:* Wm. Orr, I. Duncan McPhee, Basil Bragg. Products Sold: Everything for the theatre. AREA SERVED —Maritime Provinces including Newfoundland.

NEWFOUNDLAND

ATLANTIC FILMS & ELECTRONICS, LTD., 22 Prescott St., Saint John's. Telephones: 3071-2-3. PERSONNEL—*Managing Director:* Alberts Jekste. Products Sold: National Theatre Supply Line.

NOVA SCOTIA

*DOMINION SOUND EQUIPMENTS LTD., 76 Hollis St., Halifax. Telephones: 3-8211, 3-8212 (Emergency Night) 2-3379, 6-6385. PERSONNEL — *District Manager:* J. McEwan. *District Service Supervisor:* C. J. Gilbert. AREA SERVED—Nova Scotia, New Brunswick, Prince Edward Island, Island and Province of Newfoundland.

ONTARIO

DOMINION SOUND EQUIPMENTS LTD., 270 MacLaren St., Ottawa. Telephone: 6-7421. PERSONNEL—*Manager:* D. E. Neill.

ARROW FILMS, LTD., 214 Adelaide St., W., Toronto 1.

*COLEMAN ELECTRIC CO., 18 Dundas Square, Toronto.

DOMINION SOUND EQUIPMENTS LTD., 386-388 Victoria St., Toronto 2. Telephone: EMpire 8-6131. PERSONNEL—*District Manager:* D. E. Daniel. *Manager, Theatre Equipment:* L. E. Rice. *Salesmen:* H. R. Hansher, V. Castle, G. E. Clews. *Manager, Sound Systems:* F. S. Hastie. *Salesmen:* D. G. Boynton, J. M. Cohoe, H. Montagnes. *Manager, Acoustical Sales:* H. Eve. AREA SERVED—Ontario.

GENERAL THEATRE SUPPLY CO., LTD., 861 Bay St., Toronto 5. Telephone: EMpire 4-9307. PERSONNEL—*President and General Manager:* George Cuthbert. *Vice-President and Secretary:* C. E. Yonson. *Purchasing Agent:* J. Leonard. *Supervisor Projection:* T. C. Hoad. *Sales Engineers:* P. R. Hayes, P. L. Shea. AREA SERVED—Ontario.

PERKINS ELECTRIC CO., LTD., 277 Victoria St. Toronto. Telephones: EMpire 4-6243 — (Emergency Night) EMpire 4-6243. PERSONNEL—*Manager:* R. V. Shale. *Salesmen:* A. A. Richardson, W. Walterhouse. *Sound Division:* W. Fitten, K. Johnston, F. Demsar. *Counter Men:* M. Ashbee, S. Parker. *Shippers:* D. Casemore, T. McBride. AREA SERVED—Ontario.

THE ROBERT SIMPSON CO., LTD., Contract Division, Toronto. PERSONNEL — *Manager, All Branches:* L. E. Wicklum. *Salesman, Toronto:* E. W. Bryant. *Montreal:* J. F. Davies. *Halifax:* H. R. Tamplet. *Winnipeg:* J. C. G. Hood. *Regina:* R. G. Webber. *Edmonton:* R. A. Harris. *Vancouver:* R. H. Dickson. AREA SERVED — Dominion of Canada.

QUEBEC

DOMINION SOUND EQUIPMENTS LTD., 4040 St. Catherine St., W. Montreal 6. Telephone: FItzroy 9663. PERSONNEL—*Vice-President and General Manager:* F. E. Peters. *General Sales Manager:* Lloyd C. Pearson. *District Manager:* H. S. Walker. *Manager, Equipment Sales and Service:* P. L. Keppie. *Salesmen:* A. Lalumiere, J. J. Kilcullen.

GENERAL THEATRE SUPPLY CO., LTD., 288 St. Catherine St., W., Montreal 18. Telephone: UNiversity 6-6911 (Day and Night). PERSONNEL — *District Manager:* H. H. Burko. *Sound Engineers:* Jean Lajeunie, P. Galliard, J. H. Hewson. *Office Manager:* L. J. Davis. *Salesman:* R. Bousquet. AREA SERVED—Quebec, Eastern Ontario.

PERKINS ELECTRIC CO., LTD., 1197 Phillips Place, Montreal 2. Telephone: UNiversity 1-3666 (Day and Night) LAncaster 2154. PERSONNEL — *Vice-President and General Manager:* L. M. Bleackley. *Sales Manager:* Armand Besse. *Salesmen:* B. H. Lavell, G. Laliberte, A. Boudreau. *Servicemen:* G. Nadeau, R. Whibley, R. Dery, B. Marquis. *Controller:* J. G. Elliott. AREA SERVED—Quebec.

RCA VICTOR CO., LTD., 1001 Lenoir St., Montreal 30. Products Sold: RCA Theatre and Sound Equipment.

DOMINION SOUND EQUIPMENTS LTD., 1299 Blvd. Charest, Quebec, P. Q. Telephone: 7-3572. PERSONNEL—*Sales-Service:* J. M. Coté, Cyrille Goudreault. AREA SERVED—Quebec City and vicinity.

SASKATCHEWAN

DOMINION SOUND EQUIPMENTS LTD., 5 Pisch Block, 1651 - 11th Ave., Regina. Telephone: 29730. PERSONNEL—*Salesman:* L. B. Cogger. *Sales and Service:* L. A. Sass. AREA SERVED—Saskatchewan.

Supply Dealers of the Rest of the World

Comprehensive Listing of Names, Addresses, Personnel, Products, and the Areas Served

ALGERIA

COMPTOIR CINEMATOGRAPHIQUE NORD-AFRICAN. 6 Rue d'Isly, Algiers. Products Sold: National Theatre Supply line.

WESTREX CO., FRANCE-BELGIUM, 47 Rue Michelet, Algiers. Products Sold: Westrex Corp. line. AREA SERVED —Algeria, Tunisia and Morocco.

WESTREX CO., FRANCE-BELGIUM, Impasse Thierry, Oran. Products Sold: Westrex Corp. line.

ARGENTINA

CIA COMERCIAL CONDOR, Sarmiento 2149, Buenos Aires. PERSONNEL—Carlos Glucksmann. Products Sold: National Theatre Supply Line.

RCA VICTOR ARGENTINA, P. O. Box 4400, Bme. Mitre 1961, Buenos Aires. Products Sold: Theatre and Sound Equipment, Sound Recording Equipment, Theatre Television.

WESTREX CO., ARGENTINA, Rodriquez Pena 370, Buenos Aires. Products Sold: Westrex Corp. line. COUNTRIES SERVED —Argentina, Paraguay, Uruguay.

AUSTRIA

ELECTRO AKUSTIC GES. M.B.H., Neubaugasse 2, Vienna VII. PERSONNEL—Ing. F. Strohmaier. Products Sold: National Theatre Supply line. COUNTRY SERVED—Austria.

AUSTRALIA

WESTREX AUSTRALIA PTY. LTD., 24 Hunter St., Newcastle, New South Wales. Products Sold: Westrex Corp. line.

NATIONAL THEATRE SUPPLY CO. OF AUSTRALASIA, PTY., LTD., Film House, 251A Pitt St., Sydney, New South Wales. Cable Address: Vitavox — Sydney. Telephone: M-2231. PERSONNEL—*General Manager:* A. L. Graham. *General Sales Manager:* R. C. Smith. Products Sold: Gaumont-Kalee. AREA SERVED—Australia, Tasmania.

RCA PHOTOPHONE OF AUSTRALIA, PTY., LTD., 221 Elizabeth St., Sydney, New South Wales. Products Sold: Theatre and Sound Equipment.

RAYMAC SUPPLIES, PTY., LTD., 230 and 270 Elizabeth St., P. O. Box 3787, G. P. O., Sydney, New South Wales. PERSONNEL—*Managing Director:* R. E. McIntosh. Products Sold: Raymac Theatre and Sound Equipment. AREA SERVED — Australia, Pacific Isles, Malaya, Ceylon, N. E. I.

WESTREX AUSTRALIA PTY, LTD., Head Office: Broughton House, 181 Clarence St., Sydney, New South Wales. Products Sold: Westrex Corp. line.

NATIONAL THEATRE SUPPLY CO. OF AUSTRALASIA, PTY., LTD., Film Centre, 164-168 Melbourne St., S. Brisbane, Queensland. Telephone: J5831. PERSONNEL—*General Manager:* J. A. Welch Products Sold: Gaumont-Kalee.

WESTREX AUSTRALIA PTY. LTD., 167 Queen St., Brisbane, Queensland. Products Sold: Westrex Corp. line.

WESTREX AUSTRALIA PTY. LTD., 62 Rundle St., Adelaide, South Australia. Products Sold: Westrex Corp. line.

NATIONAL THEATRE SUPPLY CO. OF AUSTRALASIA, PTY., LTD., 315 King William St., Adelaide, South Australia. Telephone: LA 3742. PERSONNEL—*Manager:* J. P. Wright. Products Sold: Gaumont-Kalee.

GAUMONT-KALEE THEATRE SUPPLIES, 178-A Flinders St., Melbourne C.I., Victoria. Telephones: Central 1100, 1169. PERSONNEL—*Manager:* B. K. Horman. Products Sold: Gaumont-Kalee, Roycophone.

WESTREX AUSTRALIA PTY. LTD., 358 Lonsdale St., Melbourne, Victoria. Products Sold: Westrex Corp. line.

CONSOLIDATED THEATRES PTY. LTD., W.A.T.C. Building, 1 Howard St., Perth, Western Australia. Telephone: BF 2222. PERSONNEL—*Managing Director:* R. A. Yelland. *Secretary:* A. B. Newman. Products Sold: Theatre Seats, Equipment.

WESTREX AUSTRALIA PTY. LTD., 447 Murray St., Perth, Western Australia. Products Sold: Westrex Corp. line.

BELGIUM

BRITISH EQUIPMENT, S. A., 300 Rue Royale, Brussels. Telephones: 17.78.16, 17.09.31. PERSONNEL—*Managing Director:* Capt. R. H. Eliot, M.C. *Technical Department:* Michel Cledes. *35mm. Sales:* Jef Slegers. *16mm. Sales:* Maurice Eaton. *H. F. & Electronical Division:* Pierre Koob. Products Sold: Gaumont-Kalee, Bell & Howell. AREA SERVED—Belgium, Belgium Congo, Luxemborg.

BROCKLISS SIMPLEX S.A., 249 Rue Royale, Brussels. Products Sold: National Theatre Supply line. COUNTRIES SERVED—Belgium, G. D. Luxemborg.

FIBROCIT, 26 Rue Masui, Brussels. Products Sold: Theatre Seats.

SOCIETE BELGE INDUSTRIELLE, S.A., 14 Square Marie-Louise, Brussels. Products Sold: RCA Theatre and Sound Equipment.

WESTREX CO., FRANCE-BELGIUM, 16 Place des Martyrs, Brussels. Products Sold: Westrex Corp. line. COUNTRIES SERVED —Belgium and Luxembourg.

BERMUDA

BERMUDA GENERAL THEATRES, LTD., Somers Building, Hamilton. Products Sold: National Theatre Supply Line.

BOLIVIA

PALACIOS Y CIA, Casilla de Correo 648, La Paz. Products Sold: National Theatre Supply Line.

S. A. C. I., Suers. de Simon F. Bedoya, Casilla 346, La Paz. Products Sold: RCA Theatre and Sound Equipment.

BRAZIL

R. EKERMAN, Rua Senador Dantas 76-15°, Rio de Janeiro. Products Sold: National Theatre Supply Line.

RCA VICTOR RADIO, S.A., Caixa Postal 2726, Rio de Janeiro. PERSONNEL—*Theatre Dept. Mgr.:* J. Wasser. Products Sold: Theatre and Sound Equipment. *Branches:* S. Paulo, Recife, Porto Alegre.

WESTREX CO., BRAZIL, (formerly Western Electric Co. of Brazil) Rua Juan Pablo Duarte 38, Rio de Janeiro. Products Sold: Westrex Corp. line.

R. EKERMAN, Rua Conselheiro Nebias 263-1°, Sao Paulo. Products Sold: National Theatre Supply Line.

WESTREX CO., BRAZIL, (formerly Western Electric Co. of Brazil) Rua dos Guianazes #153, Sao Paulo. Products Sold: Westrex Corp. line.

BRITISH HONDURAS

MACMILLAN BROTHERS, Belize. Products Sold: RCA Theatre and Sound Equipment. AREA SERVED—Colony of British Honduras.

BURMA

CINE SUPPLY CO., 264 Barr St., Rangoon. Telephone: South 546. PERSONNEL—*Managing Partner:* Vijay Kumar. Products Sold: RCA Theatre and Sound Equipment, Ross Projectors, Premier accessories. COUNTRY SERVED—Union of Burma.

G. K. THEATRE SUPPLY CO., LTD., Scott's Building, 528 Merchant St., Rangoon. Telephone: S-653. Products Sold: Gaumont-Kalee, Typhoon Air Conditioning Units, Bell & Howell. COUNTRY SERVED—Union of Burma.

CEYLON

CEYLON THEATRES LTD., 8 Parsons Road, Colombo. PERSONNEL—*Chairman:* Sir Chittampalam A. Gardiner. Products Sold: Gaumont-Kalee, Bell & Howell, Kershaws.

WESTREX CO., INDIA, Iceland Buildings, Galle Road, Colombo. Products Sold: Westrex Corp. line.

CHILE

CORPORACION DE RADIO DE CHILE, S.A., Casilla 1407, Santiago. Products Sold: RCA Theatre and Sound Equipment.

OSSA & MAX, Casilla 9820, Santiago. Products Sold: National Theatre Supply Line. COUNTRY SERVED—Chile.

WESTREX CO., ANDEAN, (formerly Western Electric Co., Andean) Edificio Sud America, Bandera Esquina Augustinas, Santiago. Products Sold: Westrex Corp. line.

COLOMBIA

J. GLOTTMANN S.A., Carrera 13 #24-15, Bogota. PERSONNEL—*President:* Jack Glottmann. Products Sold: National Theatre Supply Line and RCA Theatre and Sound Equipment.

WESTREX CO., CARIBBEAN, Carrera 5A, No. 19-40, Bogota. Products Sold: Westrex Corp. line.

CINE COLOMBIA, S.A., Medellin. Products Sold: Gaumont-Kalee, Wenzel Projection and Sound Equipment, Lorraine Carbons.

COSTA RICA

IMPORTADORA FILMICA COMMERCIAL, LTDA., Apartado Correo 939, San Jose. Products Sold: RCA Theatre and Sound Equipment.

PAN AMERICAN TRADING CO., LTD., Apartado 2018, San Jose. PERSONNEL—*Owner and Manager:* Francisco Pena. Products Sold: National Theatre Supply Line COUNTRIES SERVED—Nicaragua, Guatemala, Costa Rica.

JOSE RAVENTOS, Apartado 1147, San Jose. Products Sold: RCA Theatre and Sound Equipment.

DENMARK

BANG & OLUFSEN A/S, Bregade 34, Copenhagen. PERSONNEL—L. A. Duus Hansen. Products Sold: National Theatre Supply Line.

*NORDISK KINOTEKNIK A/S, Frederiksberggade 16, Copenhagen K. Telephone: Central 11666. Products Sold: Gaumont-Kalee, Ship Carbons, Ampro 16mm Projectors, Stage Lighting Equipment.

WESTREX CO. A/S, Vesterport 481, Copenhagen. Telephone: Central 5598. Products Sold: Westrex Corp. line.

DOMINICAN REPUBLIC

CLAUDIO FERNANDEZ, Avenida Mella No. 97, Ciudad Trujillo. Products Sold: RCA Theatre and Sound Equipment.

JOAQUIN GINEBRA, Apartado 902, Ciudad Trujillo. Products Sold: National Theatre Supply Line. COUNTRY SERVED—Dominican Republic.

* Listing not confirmed by Supply Dealer

ECUADOR

JAIME PUIG AROSEMENA, Apartado Correos 89, Guayaquil. Products Sold: Gaumont-Kalee.

ELECTRONICA S.A., Apartado 3509, Guayaquil. PERSONNEL—*Owner and Director:* Luigi Rota. *Manager:* Emilio Bini. Products Sold: National Theatre Supply Line and RCA Theatre and Sound Equipment. AREA SERVED—Coast Zone of Ecuador.

SOCIEDAD RADIOTECNICA ECUATORIANA, Apartado 414, Quito. PERSONNEL—*Owner and Director:* Luigi Rota. *Managers:* Alessandro Patruno, Ing. Igilio Perotti. Products Sold: National Theatre Supply Line and RCA Theatre and Sound Equipment. COUNTRY SERVED—Ecuador.

EGYPT

ISIDORE LEVY, Head Office: 22 bis Avenue Fouad 1st, Alexandria. Telephone: 20728. Products Sold: Film and Projection Equipment Accessories, Lorraine Carbons. AREA SERVED — Egypt, Sudan, Lybia, Eritrea.

WESTREX CO., EAST, 22 (Bloc C) Rue Fouad 1er, Alexandria. Products Sold: Westrex Corp. line. AREA SERVED—Egypt, Greece, Iran, Iraq, Arabia, Abyssinia, Eritrea, Aden; Italian, French, and British Somaliland; Syria, Lebanon.

*W. A. LANCASTER & SON, Head Office: 11 Emad El Dine St., Cairo. Sales: 4, Haret Soufi (Sharia Adly Pacha), Cairo.

WESTREX CO., EAST, 5, Rue Kasr-El-Nil, Cairo. Products Sold: Westrex Corp. line.

ENGLAND

J. FRANK BROCKLISS, LTD., 27 John Bright St., Birmingham. PERSONNEL—*Branch Manager:* A. B. Boulton. Products Sold: National Theatre Supply Line.

G. B—KALEE LTD., 57 John Bright St., Birmingham. Telephone: Midland 2351. PERSONNEL—*Branch Manager:* Harold A. Richardson. *Divisional Engineer:* H. E. Munslow. Products Sold: Gaumont-Kalee. AREA SERVED—The Midlands.

RCA PHOTOPHONE LTD., 164 Stratford Road, Shirley, Birmingham. Telephone: Shirley Birmingham 1819. PERSONNEL—*District Manager:* S. J. C. Taylor. Products Sold: Theatre and Sound Equipment.

THEATRE SEATS LTD., 160 Cape Hill, Smethwick, Staffs., Birmingham. PERSONNEL—*Directors:* A. J. Dean, C. Pickett, D. Dean. Products Sold: Theatre Seating, Complete Theatre Equipment.

WESTREX CO., LTD., 49 Broad St., Birmingham. Products Sold: Westrex Corp. line.

G. B—KALEE LTD., 9 Park Lane, Cardiff. Telephone: 28861. PERSONNEL—*Branch Manager:* C. J. Morris. Products Sold: Gaumont-Kalee. AREA SERVED — South Wales and West of England.

RCA PHOTOPHONE LTD., 57-59 Charles St., Cardiff. Telephone: Cardiff 30194. PERSONNAL—*District Manager:* C. J. Higgins. Products Sold: Theatre and Sound Equipment.

WESTREX CO., LTD., 10 Museum Place, Cardiff, Wales. Products Sold: Westrex Corp. line.

J. FRANK BROCKLISS, LTD., 67 Britannia House, Wellington St., Leeds. Telephone: Leeds 24509. PERSONNEL—*Branch Manager:* W. D. Raphael. Products Sold: National Theatre Supply Line. AREA SERVED—Yorkshire, Lincolnshire, Nottinghamshire, Derbyshire.

*G. B.—KALEE LTD., 17 Wellington St., Leeds. PERSONNEL—*Manager:* Dennis V. Sumpter. *Divisional Engineer:* R. S. Folland. Products Sold: Gaumont-Kalee.

FRED V. STEELE LTD., CINEMA & THEATRE SUPPLIER, 7, Stainburn Drive, Leeds 7. Telephone: Leeds 68-2852. Products Sold: Projection, Sound, and Theatre Equipment. AREA SERVED—Yorkshire, Lincolnshire, Nottinghamshire.

WESTREX CO., LTD., Wellington Chambers, Wellington Street, Leeds 1. Products Sold: Westrex Corp. line.

J. FRANK BROCKLISS, LTD., 167/169 Wardour St., London, W1. PERSONNEL—*Owner:* J. Frank Brockliss. *Director and Manager:* F. E. Durban. Products Sold: National Theatre Supply Line. AREA SERVED—All of Europe.

GENERAL BUILDING & THEATRE EQUIPMENT LTD., Stoll Offices, London Coliseum, London, WC2. Telephone: Temple Bar 1500. PERSONNEL—*General Manager:* Charles Pickett. Products Sold: Complete Theatre Equipment and Supplies.

RCA PHOTOPHONE LTD., Head Office: 36 Woodstock Grove, London, W.12. Telephone: Shepherds Bush 1200. PERSONNEL—*Managing Director:* P. A. Turnor. *Directors:* J. C. Atkinson, C. J. Bridge, W. F. Garling, C. G. Mayer, O. B. E., Sir Louis Sterling. Products Sold: Theatre and Sound Equipment.

WESTREX CO., LTD., Head Office: Liberty House, 222 Regent St., London, W1. Products Sold: Westrex Corp. line.

WESTREX CO., LTD., Foubert's Place, Regent St., London, W1. Products Sold: Westrex Corp. line.

WESTREX CO., LTD., 152 Coles Green Road, Cricklewood, London, NW2. Products Sold: Westrex Corp. line.

J. FRANK BROCKLISS, LTD., 3, The Parsonage, Manchester. PERSONNEL—*Branch Manager:* W. Chilton. Products Sold: National Theatre Supply Line.

G. B—KALEE, LTD., 5, The Parsonage, Manchester. Telephone: Blackfriars 1428. PERSONNEL—*Branch Manager:* Harry Mould. Products Sold: Gaumont-Kalee. AREA SERVED—East, West and South Lancashire; part of Cheshire.

RCA PHOTOPHONE LTD., 274 Deansgate, Manchester. Telephone: Blackfriars 7092. PERSONNEL—*District Manager:* A. J. Bush. Products Sold: Theatre and Sound Equipment.

WESTREX CO., LTD., 1 North Parade, Deansgate, Manchester 3. Products Sold: Westrex Corp. line.

G. B.—KALEE LTD., 2 Cross St., Newcastle-on-Tyne. Telephone: Newcastle 23038. PERSONNEL—*Branch Manager:* W. Yeomans. Products Sold: Gaumont-Kalee. AREA SERVED—Northumberland, Durham, Cumberland, North Yorkshire.

CROWE & CO., LTD., 52 Stowell St., Newcastle-on-Tyne. Products Sold: National Theatre Supply Line.

RCA PHOTOPHONE LTD., 36 Clayton St. W., Newcastle-on-Tyne. Telephone: Newcastle 27771. PERSONNEL—*District Manager:* R. T. Wheatley. Products Sold: Theatre and Sound Equipment.

WESTREX CO., LTD., 1 Charlotte Sq., Newcastle-on-Tyne. Products Sold: Westrex Corp. line.

WESTREX CO., LTD., Angel Row, Nottingham. Products Sold: Westrex Corp. line.

A. BUCKLEY, 9 Branch Road, Batley, Yorkshire. Telephones: Batley 431, Morley 902. Products Sold: Projection, Sound and Theatre Equipment.

FINLAND

AMPRO-MYYNTI, OY, Fredikinkatu 20-A, Helsinki. PERSONNEL — *Manager:* Kai Nordlund. Products Sold: National Theatre Supply Line.

G. W. BERG & CO., 14 Fabianinkatu, Helsinki. Products Sold: RCA Theatre and Sound Equipment.

FRANCE

BROCKLISS SIMPLEX S.A., 295 Cours de la Somme, Bordeaux. Products Sold: National Theatre Supply Export Line.

BROCKLISS SIMPLEX S.A., 102 La Canabiere, Marseille. *Manager:* Henri Barody. Products Sold: National Theatre Export Line.

WESTREX CO., FRANCE-BELGIUM, 3 Cours Joseph Thierry, Marseille. Products Sold: Westrex Corp. line.

BROCKLISS SIMPLEX S.A., 6 Rue Guillaume Tell, Paris 17e. PERSONNEL—*General Manager:* Albert Gillet. Products Sold: National Theatre Supply Line. AREA SERVED—France, French North Africa, Switzerland, Belgium.

STE. DES THEATRES CINEMATOGRAPHIQUES PATHE, S.A., 6 Rue Francoeur, Paris 18e. PERSONNEL—J. Ottoz. Products Sold: RCA Theatre and Sound Equipment. AREA SERVED—Algiers, France.

*STE. d'EQUIPMENT CINEMATOGRAPHIQUE, S.A., 61, rue Pierre Demours, Paris 17e. Telephone: MAC-Mahon 22-00. Products Sold: Gaumont-Kalee, Bell & Howell.

WESTREX CO., FRANCE-BELGIUM, Head Office: 120 Avenue des Champs Elysees, Paris. Products Sold: Westrex Corp. line.

GREECE

CHARILAOS PETROPOULOS, 51 El. Venizelou Str., Athens. Products Sold: RCA Theatre and Sound Equipment.

SPYROS D. SKOURAS, 5 Santarosa St., Athens. Telephone: 21-824. Products Sold: National Theatre Supply Line. COUNTRY SERVED—Greece.

GUATEMALA

ADOLFO RIOS, P. O. Box 97, Guatemala City. Products Sold: RCA Theatre and Sound Equipment.

RAMIRO SAMAYOA M., Avenida Elena Sur 37-75, Cine Popular, Guatemala City. Products Sold: National Theatre Supply Line. COUNTRY SERVED—Guatemala.

E. F. TOPPE, Callejon Castillo No. 7, Guatemala City. Products Sold: Westrex Corp. line. AREA SERVED—Guatemala, El Salvador, Honduras, and British Honduras.

HAWAII

CONSOLIDATED AMUSEMENT CO., LTD., Merchandise Department, 1120 Bethel St., Honolulu 11. Telephones: (Emergency Night) 32449, 94984. PERSONNEL—*Manager Merchandise Department:* J. A. Madden. Products Sold: Simplex Projection and Sound Equipment, RCA Theatre and Sound Equipment, Heywood-Wakefield Seats.

THEATRICAL EQUIPMENT CO., 2826 S. King St., Honolulu 72. Telephones: 94287, 990958. PERSONNEL—*Business Manager:* Hal Lewis. *Prod Manager:* E. L. Carlson. Products Sold: B. F. Shearer Supply line. AREA SERVED—Hawaiian Islands.

HONDURAS

ESTEVEZ Y LAZARUS CLAMER, Apartado Postal 110, Tegucigalpa. Products Sold: RCA Theatre and Sound Equipment.

OSMOND MADURO, Apartado 213, Tegucigalpa. Products Sold: National Theatre Supply Line.

HONG KONG

ELEPHANT RADIO & ENGINEERING, 209 Bank of East Asia Bldg., Hong Kong. Products Sold: Custom made equipment, RCA Theatre and Sound Equipment, National Theatre Supply Line.

MAITLAND & CO., G.P.O. Box 2287, Hong Kong. PERSONNEL — Robert Maitland. Products Sold: RCA Theatre and Sound Equipment. AREA SERVED—Hong Kong.

WESTREX CO., ASIA, 304 Victory House, Wyndham St., Hong Kong. Products Sold: Westrex Corp. line. AREA SERVED—Hong Kong.

*MANNERS ENGINEERING, LTD., Alexandra House, Hong Kong. Products Sold: Gaumont-Kalee and Cinetechnic.

ICELAND

SNORRI P. B. ARNAR, P. O. Box 354. Reykjavik. Products Sold: RCA Theatre and Sound Equipment.

INDIA

CHICAGO TELEPHONE & RADIO CO., LTD., 37-38 Silver Jubilee Road, Bangalore. Products Sold: B. T. H. 35mm. and 16mm. Equipment.

CINE SUPPLIES LTD., 5th Main Road, Gandhinager, Bangalore City. Products Sold: Gaumont-Kalee.

EVERGREEN (BANGALORE) LTD., 3 Seshadri Road, Bangalore 1. Telephone: Bangalore 2608. PERSONNEL — K. L. Bhatia. Products Sold: National Theatre Supply Line. AREA SERVED—South Indian Territory.

EVERGREEN PICTURES, Municipal Park, Bhusawal. Products Sold: National Theatre Supply Line. Victor 16mm. Projectors. AREA SERVED—Madhya Pradesh, Madhya Bharat, Madhya Rajasthan.

THE CINE AGENCY (INDIA), 18 New Queen's Road, Bombay 4. Products Sold: Zeiss Ikon, Stuttgart 35 and 16mm. Cinema and Sound Projectors and Accessories.

CINEFONES, 3, New Queen's Road, Bombay 4. PERSONNEL—*Managing Partner:* S. B. Agarwal. Products Sold: Theatre Equipment and Accessories. AREA SERVED—Bombay Presidency.

EASTERN ELECTRIC & ENGINEERING Co., 129 Mahatma Gandhi Road, Post Box 459, Bombay 1. Products Sold: B. T. H. 35mm. and 16mm. Equipment.

EVERGREEN PICTURES, Post Box No. 3515, Bombay 4. PERSONNEL—S. N. Kotwal, H. C. Naterwalla, Mrs. P. C. Kapadia, M. C. Kapadia, N. C. Kapadia, M. N. Kapadia, M. R. Kapadia, J. R. Kapadia, E. C. Naterwalla. Products Sold: Simplex XL and complete National Theatre Supply Line, Victor 16mm. Projectors. COUNTRY SERVED—India.

GAUMONT-KALEE, LTD., Forbes Building, Home St., Bombay. Products Sold: Gaumont-Kalee.

PHOTOPHONE EQUIPMENTS, LTD., 9 Marine Lines, P. O. Box 394, Bombay 1. PERSONNEL—*Managing Director:* M. A. Fazalbhoy. Products Sold: RCA Theatre and Sound Equipment, National Theatre Supply Line, National Carbons. AREA SERVED—India, Pakistan, Burma, Ceylon, Afghanistan.

RAVEL SONS, Shradhanad Road, Bombay 24.

WESTREX CO., INDIA, Head Office: Metro House, Esplanade Road, Bombay 1. Products Sold: Westrex Corp. line. AREA SERVED—India, Burma, Ceylon.

CHICAGO TELEPHONE & RADIO CO., LTD., 25 Chowringhee, Calcutta. Products Sold: B. T. H. 35mm. and 16mm. Equipment.

EVERGREEN PICTURES CORP., 11 Esplanade Row, East, Calcutta. Products Sold: National Theatre Supply Line

*GAUMONT-KALEE, LTD., Society Cinema, Corporation Place, Calcutta. Products Sold: Gaumont-Kalee.

GENERAL RADIO & APPLIANCES, LTD., 10, Old Court House Street, Calcutta 1. Telephone: City 6038. PERSONNEL—*Managing Director:* Y. A. Fazalbhoy. *Branch Manager:* D. V. J. Raju. Products Sold: RCA Theatre and Sound Equipment, National Theatre Supply Line, Strong Lamps and Rectifiers, International Seats. AREA SERVED—Provinces of West Bengal, Bihar, Orissa, Assam and Kingdom of Nepal.

WESTREX CO., INDIA, Lighthouse Cinema Bldg., Calcutta. Products Sold: Westrex Corp. line.

CINEFONES (DELHI) LTD., Behind Imperial Bank, Chandni Chowk, Delhi. PERSONNEL—*Managing Director:* S. N. Agarwal. Products Sold: RCA Theatre and Sound Equipment. AREA SERVED—Delhi, U. P., Punjab.

* Listing not confirmed by Supply Dealer

EVERGREEN PICTURES, Chandni Chowk, Delhi. PERSONNEL—*Manager:* D. N. Sant. Products Sold: National Theatre Supply Line. AREA SERVED—Delhi, U. P., Punjab, Pepsu Himachal Pradesh, and Jammu and Kashmir State.

PHOTOPHONE EQUIPMENTS, LTD., 72 Queensway, Delhi. Products Sold: RCA Theatre and Sound Equipment, National Theatre Supply Line, Strong Lamps and Rectifiers, International Seats.

WESTREX CO., INDIA, Brampton Road, near Minerva Cinema, Kashmiri Gate, Delhi. Products Sold: Westrex Corp. line.

CINEFONES (DELHI) LTD., Old Railway Road, Jullundur City. PERSONNEL—*Managing Director:* S. N. Agarwal. Products Sold: RCA Theatre and Sound Equipment. AREA SERVED—Punjab.

CHICAGO TELEPHONE & RADIO CO., LTD., 48 Hazratganj, Lucknow. Products Sold: B. T. H. 35mm. and 16mm. Equipment.

CHICAGO TELEPHONE & RADIO CO., LTD., 196 Mount Road, Madras. Products Sold: B. T. H. 35mm. and 16mm. Equipment.

THE CINE AGENCY (INDIA), Airways House, 9, Mount Road, Madras 2. Telephone: 85333. PERSONNEL — *Manager, Madras Branch:* M. Venkataraman. *Asst. Manager:* V. K. Janakiraman. *Chief Engineer:* M. V. Ramachandran. Products Sold: Zeiss Ikon, Stuttgart 35mm and 16-mm equipment and accessories. AREA SERVED—Madras Presidency.

*CINE SUPPLIES LTD., 1/155 Rayala Corp. Bldg., Mount Road, Madras. Products Sold: Gaumont-Kalee.

EVERGREEN (BANGALORE) LTD., 177-179 Mount Road, Madras 2. Products Sold: National Theatre Supply Line.

GENERAL RADIO & APPLIANCES. LTD., Bharath Building, 1/18 Mount Road, Madras. Products Sold: RCA Theatre and Sound Equipment, National Theatre Supply Line, Strong Lamps and Rectifiers, International Seats. AREA SERVED—Madras, Andhra, Mysore, Travancore-Cochin.

WESTREX CO., INDIA, Khaleeli Mansions, 35 Mount Road, Madras. Products Sold: Westrex Corp. line.

CHICAGO TELEPHONE & RADIO CO., LTD., 68 Queensway, New Delhi. Products Sold: B. T. H. 35mm. and 16mm. Equipment.

CINE SUPPLIES LTD., Rastrapati Road, Secunderbad 3. Products Sold: Theatre Equipment and Accessories.

EVERGREEN (BANGALORE) LTD., 1/D Kingsway, Secunderbad. Products Sold: National Theatre Supply Line.

INDONESIA

WESTREX CO., ASIA, Tanah Abang Barat nr. 2, Djakarta. Products Sold: Westrex Corp. line.

ZORO CORP. OF INDONESIA, Djalan Modjopahit 30, Djakarta. Products Sold: RCA Theatre and Sound Equipment.

WESTREX CO., ASIA, Rubatan #7, Surabaia. Products Sold: Westrex Corp. line.

WESTREX CO., ASIA, Djalan Banda #2, Bandung. Products Sold: Westrex Corp. line.

IRAQ

NAIM AIZER & CO., King Ghazi Cinema Building, Baghdad. Products Sold: National Theatre Supply Line. COUNTRY SERVED—Iraq.

HAFIDH AL-KADI, Al-Rashad St., Baghdad. Products Sold: RCA Theatre and Sound Equipment. AREA SERVED—Iraq, Kuwait.

IRELAND

G. B.—KALEE, LTD., 43 Donegall St., Belfast. Products Sold: Gaumont-Kalee. AREA SERVED—Northern Ireland.

RCA PHOTOPHONE LTD., 58 Howard St., Belfast. Telephone: 24762. PERSONNEL—*Northern Ireland and Republic of Ireland Manager:* N. J. Railton. Products Sold: Theatre and Sound Equipment.

CENTURY MACHINERY STORES, LTD., 93 Middle Abbrey St., Dublin. PERSONNEL—*Manager:* Maurice Baum. Products Sold: National Theatre Supply Line.

RCA PHOTOPHONE LTD., 34 Lower Abbey St., Dublin. Telephone: 43842. PERSONNEL—*Area Supervisor:* H. W. Neill. Products Sold: Theatre and Sound Equipment.

WESTREX CO., LTD., 7-8 Lower Abbey St., Dublin. Products Sold: Westrex Corp. line.

ISRAEL

AMPA, LTD., 16 Petah Tikvah Rd., P. O. Box 636, Tel-Aviv. Telephone: 3228. PERSONNEL—*Theatre Department Manager:* M. Kolari. Products Sold: National Theatre Supply Line. COUNTRY SERVED—Israel.

CARASSO BROTHERS, P. O. Box 364, Tel-Aviv. Products Sold: RCA Theatre and Sound Equipment.

J. GREEN & CO. (PALESTINE) LTD., Cine Dept., 6 Beth Hashoeva Lane, Tel-Aviv. Telephone: 4492. Products Sold: G. B. Kalee, Bell & Howell, DeVry.

LEVANT X-RAY, LTD., 39 Wolfson St., Tel-Aviv. Telephones: 62144, 62642. PERSONNEL—H. H. Aldor. Products Sold: Motiograph. COUNTRY SERVED—Israel.

ITALY

RADIO E TELEVISIONE ITALIANA, S.P.A., Via Giulio Caccini No. 1, Rome. Products Sold: RCA Theatre and Sound Equipment.

WESTREX CO., ITALY, Piazza Lovatelli 1, Rome. Products Sold: Westrex Corp. line.

JAPAN

ACME TRADING CO., INC., Higobashi Building, 5 Tosaboridori 1 chome, Nishi-ku, Osaka.

NIHON EIGA SHIZAI CO., LTD., 46, Nakajima-cho, Fukuoka C. Telephone: 3-5362. PERSONNEL—*Manager:* Toshiyuki Ohbayashi. Products Sold: Matsuda Theatre and Sound Equipment.

NIHON EIGA SHIZAI CO., LTD., 1-7, Hijiecho, Nakamuraku, Nagoya C. Telephone: 23-6473. PERSONNEL — *Manager:* Kisaburow Yamaguchi. Products Sold: Matsuda Theatre and Sound Equipment.

NIHON EIGA SHIZAI CO., LTD., 5-833 Nishibori-dohri, Niigata City, Niigata. Telephone: Niigata 8941. Products Sold: Matsuda Theatre and Sound Equipment.

NIHON EIGA SHIZAI CO., LTD., 2-3119, Honcho, Niitsu C. Telephone: 0144. PERSONNEL—*Manager:* Tadashi Takeda. Products Sold: Matsuda Theatre and Sound Equipment.

NIHON EIGA SHIZAI CO., LTD., 1-21, Kitahama, Higashiku, Osaka C. Telephones: 23-2427, 23-2429. PERSONNEL — *Manager:* Kisaburow Yamaguchi. Products Sold: Matsuda Theatre and Sound Equipment.

NIPPON ONKYOSEKI CO., LTD., Funakoshi-Cho, Higashi-Ku, Osaka. Products Sold: National Theatre Supply Line.

NIHON EIGA SHIZAI CO., LTD., 3-19, Hanazonocho, Otaru C. Telephone: 3866. PERSONNEL — *Manager:* Masao Negishi. Products Sold: Matsuda Theatre and Sound Equipment.

NIHON EIGA SHIZAI CO., LTD., 72 Higashi 4-chome, Sendai C. Telephone: Sendai 4057. PERSONNEL — *Manager:* Tsunenobu Anasawa. Products Sold: Matsuda Theatre and Sound Equipment.

CONSOLIDATED THEATRE & TELEVISION SUPPLY CORP., No. 4, S-Chome, Shiba-Shimbasi, Minato-Ku, Tokyo. Products Sold: National Theatre Supply Line.

MPI CORP., 29, 2-chome, Nagata-Cho, Chiyoda-Ku, Tokyo. Products Sold: RCA Theatre and Sound Equipment.

NIHON EIGA SHIZAI CO., LTD., Head Office: Room 526, Marunouchi Bldg., Marunouchi, Tokyo. Telephones: 20-0891, 20-4721. Branch Office: Room 516, Marunochi Bldg., Marunouchi, Tokyo. Telephones: 20-3357, 20-4720. PERSONNEL — *Manager:* Jitsutarow Kishino. Products Sold: Matsuda Theatre and Sound Equipment.

WESTREX CO., ORIENT, Mihara Bldg., No. 5, 4 chome, Ginza, Chuo-ku, Tokyo. Products Sold: Westrex Corp. line.

LEBANON

NICHOLAS J. PRELORENZO, Rue Boutros Karamé, Immeuble Sokolovitch, P. O. Box 341, Beyrouth. Products Sold Westrex Corp. line.

*N. ZABBAT, Rue Allenby, Post Office Box 741, Beyrouth.

LIBERIA

OEST AFRICAANSCHE COMPAGNIE, Monrovia. Products Sold: RCA Theatre and Sound Equipment.

MALAYA

SHAW BROTHERS, LTD., 112/120 Robinson Rd., Singapore. Products Sold: National Theatre Supply Line. COUNTRY SERVED—Malaya.

*Listing not confirmed by Supply Dealer



The new techniques are opening new worlds of box office excitement . . . and NATIONAL is delivering the world's finest equipment . . .

Simplex

to match the exacting demands of these new PROJECTION and SOUND techniques!

"VISTAVISION"

Distributors Throughout the World!

NATIONAL THEATRE SUPPLY *Export*

92 GOLD STREET, NEW YORK 38, U. S. A. • CABLE ADDRESS NATHESUPLY, N. Y.

*H. A. O'CONNOR & CO. LTD., 8/12 Laidlaw Building, Battery Road, Singapore. Products Sold: Gaumont-Kalee.

WESTREX CO., ASIA, 138 Robinson Road, Singapore. Products Sold: Westrex Corp. line. AREA SERVED — Malaya, North Borneo, French Indo-China.

MALTA

GENERAL SALES COMPANY, 48 Kingsway, Valletta. PERSONNEL — *Managing Director:* Michael Grech. Products Sold: RCA Theatre and Sound Equipment, Gaumont-Kalee. AREA SERVED—Malta, Gozo.

MAURITIUS

BLANCHE, BIRGER CO., LTD. 12 Intendence St., Port Louis. Products Sold: RCA Theatre and Sound Equipment.

MEXICO

DEKSA, S.A., Puebla #301, Mexico 7, D.F. Products Sold: Theatre, Studio and Laboratory equipment and accessories.

EQUIPOS PARA CINES, S.A., Madrid, 10, Mexico 4, D.F. PERSONNEL — *President:* Manuel Ampudia. *Manager:* José Desquéns. Products Sold: National Theatre Supply Line.

RCA VICTOR MEXICANA, S.A. de C.V., Avenida Cuitláhuac 2519, Mexico 17, D.F. PERSONNEL—*President:* Joseph P. Toole. *General Manager:* Paul W. Hessinger. *General Sales Manager:* W. S. Rolston. Products Sold: Theatre and Sound Equipment. COUNTRY SERVED—Mexico.

WESTREX CO., MEXICO, Avenida Morelos 64, Mexico, D.F. Products Sold: Westrex Corp. line.

MOROCCO

F. POULIQUE, 208 Boulevard de la Gare, Casablanca. Products Sold: National Theatre Supply Line.

WESTREX CO., FRANCE-BELGIUM, 124 Rue Du Jura, Casablanca. Products Sold: Westrex Corp. line.

NETHERLANDS

BICKER & VAN der ROER, Sarphatikade, 4, Amsterdam. Products Sold: National Theatre Supply Line, Lorraine Carbons.

WESTREX NEDERLAND N.V., Singel 127, Amsterdam. Products Sold: Westrex Corp. line.

N. V. APPARATEN FABRIEK, LOUIS B. KAGENAAR, Jekerstraat 82, Utrecht. Telephones: 17775, 28307. PERSONNEL—*Export Manager:* G. Dijksman. Products Sold: Projectors, Elka Sound Equipment, Screens, Carbons, Curtain Machines, Rectifiers.

NEW ZEALAND

P. C. BLENKARNE, LTD., 6 Upper Queen St., Auckland. PERSONNEL — *Managing Director:* P. C. Blenkarne. *General Manager:* P. J. Blenkarne. *Branches:* Auckland, Hamilton, Palmerston North, Wellington, Christchurch. Products Sold: National Theatre Supply Line. AREA SERVED —New Zealand and South Pacific.

CHARLES CARRAD, Civic Theatre Building, Bledisloe St., P .O. Box 5020, Auckland. Products Sold: RCA Theatre and Sound Equipment.

GAUMONT-KALEE (N. Z.) LTD., St. James Building, Queen St., P.O. Box 2191, Auckland, C. I. Products Sold: Gaumont-Kalee, "Ship" Carbons, Theatre Supplies.

WESTREX CO., NEW ZEALAND LTD., 174 Queen St., Auckland. Products Sold: Westrex Corp. line.

WESTREX CO., NEW ZEALAND LTD., 806 Colombo St., Christchurch. Products Sold: Westrex Corp. line.

P. C. BLENKARNE, LTD., 1938 Cambridge Terrace, P. O. Box 1175, Christchurch. Products Sold: National Theatre Supply Line.

WESTREX CO., NEW ZEALAND LTD., c/o Empire Theatre, Princess St., Dunedin. Products Sold: Westrex Corp. line.

WESTREX CO., NEW ZEALAND LTD., Head Office: Dental and Medical Supply Bldg., 128 Wakefield St., Wellington. Products Sold: Westrex Corp. line.

NICARAGUA

EQUIPOS Y ACCESORIOS, Apartado 242, Managua. Products Sold: National Theatre Supply Line. COUNTRY SERVED — Nicaragua.

ETIENNE & CO., Apartado 433, Managua. COUNTRY SERVED—Nicaragua.

SUCESORES DE RAFAEL CABRERA, Apartado 112, Managua. Products Sold: RCA Theatre and Sound Equipment, RCA 16mm Equipment.

NORWAY

AKSJESELSKAPET PROTON, Rosenkrantzgt 11, Oslo. Products Sold: RCA Sound Equipment.

HANS H. KNUTSEN & CO., Kongens Gt. 15, Oslo. Products Sold: Gaumont-Kalee.

J. L. NERLIEN A/S, Tollbugatta 35, Oslo. Products Sold: National Theatre Supply Line and Zeiss Ikon.

PAKISTAN

ELECTRONICS & FILM EQUIPMENTS, LTD., Gulshan-E-Nusrat Building, Victoria Road, Saddar, Karachi 3. Branches at The Mall, Lahore, and Gulistan Cinema Bldg., Ramna, Dacca. Products Sold: National Theatre Supply Line, RCA Theatre and Sound Equipment.

WESTREX CO., EAST, Finlay House, Karachi. Products Sold: Westrex Corp. line.

WESTREX CO., EAST, 6, Queen's Road, Lahore. Products Sold: Westrex Corp. line.

PANAMA

PANAMA RADIO CORP., P. O. Box 406, Panama City. PERSONNEL—A. Bletterman, D. L. Sasso. Products Sold: National Theatre Supply Line and RCA Theatre and Sound Equipment. AREA SERVED—Republic of Panama, Canal Zone.

WESTREX CO., CARIBBEAN, Calle 31, No. 28, Panama City. Products Sold: Westrex Corp. line. AREA SERVED—Panama and Canal Zone.

PERU

J. CALERO PAZ, S.A., Portal de Belen 902-914, Apartado 1281, Lima. Products Sold: National Theatre Supply Line and RCA Theatre and Sound Equipment. COUNTRY SERVED—Peru.

WESTREX CO., ANDEAN, Edificio Hidalgo No. 150 y 154, Plaza San Martin, Lima. Products Sold: Westrex Corp. line. COUNTRIES SERVED—Peru, Bolivia, Ecuador.

PHILIPPINE ISLANDS

S. M. BERGER AND CO., INC., 940 Raon St., Manila. PERSONNEL—*Manager:* Bela Bass. Products Sold: National Theatre Supply Line.

PHILIPPINE ENGINEERING CORPORATION, 936 Raon St., Quiapo, Manila. Products Sold: RCA Theatre and Sound Equipment.

WESTREX CO., ASIA, 675 Florentino Torres, Manila. Products Sold: Westrex Corp. line.

PORTUGAL

J. C. ALVAREZ, LTD., 205 Rua Augusta, Lisbon. Products Sold: G. B.-Bell & Howell.

WESTREX CO., ALPINE, Rua Crucifixo, 76, 3°, N., Lisbon. Products Sold: Westrex Corp. line.

INSTITUTO PASTEUR de LISBOA, R. Nova do Almada 69, Lisbon. Products Sold: RCA Theatre and Sound Equipment.

EL SALVADOR

MANUEL VIEYTES, 1A Calle Poniente No. 32-A, San Salvador. Products Sold: National Theatre Supply line.

SUCESION CARLOS AVILA, Calle Delgado 26, San Salvador. Products Sold: RCA Theatre and Sound Equipment.

SAUDI ARABIA

MOHAMED MAHMOOD ZAHID & BROS., Jeddah. Products Sold: RCA Theatre and Sound Equipment. AREA SERVED—Saudi Arabia, Yemen.

SCOTLAND

J. FRANK BROCKLISS, LTD., 181 Howard St., Glasgow, C. 1. PERSONNEL—*Branch Manager:* E. Dobbing. Products Sold: National Theatre Supply Line.

FLOYD & CO. (GLASGOW) LTD., 114 Bath St., Glasgow, C. 2. PERSONNEL—*Directors:* John A. Mole-Floyd, W. Smart. *Sales Manager:* G. J. Meacher. *Flooring Manager:* W. Heathwood. Products Sold: Projection, Sound, Complete Theatre Equipment.

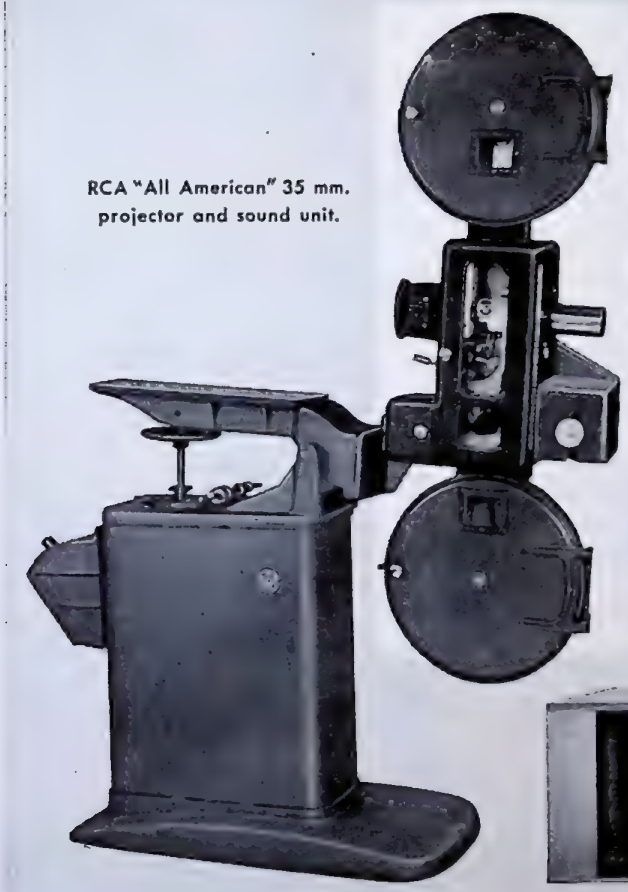
*G. B.—KALEE LTD., 211 Hope St., Glasgow. Telephone: Douglas 0601. Products Sold: Gaumont-Kalee. COUNTRY SERVED — Scotland.

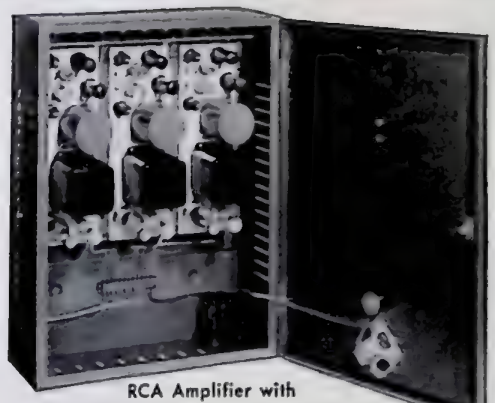
* Listing not confirmed by Supply Dealer

Lowest price ever for picture and sound in one 35 mm. unit

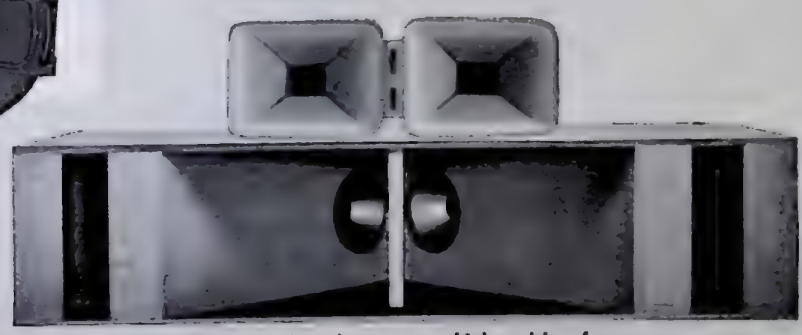
Cut your operating cost with RCA "ALL AMERICAN" theatre equipment —lower initial cost, lower maintenance, longer life!

RCA "All American" 35 mm. projector and sound unit.





RCA Amplifier with Exciter Lamp Supply and Monitor speaker.



RCA "All American" speaker system —high and low frequency.

FOR EXPORT ONLY—the finest American-made professional theatre equipment ever designed for the world market! The new RCA "All American" line includes everything from arc lamps to lenses, sound projectors to stereophonic amplifiers. Full line of RCA-quality MATCHED ACCESSORIES. Before you buy another piece of equipment, see your RCA distributor or write to the address below for the full story on RCA "All American"!

RCA INTERNATIONAL DIVISION
RADIO CORPORATION of AMERICA
RCA BUILDING
30 ROCKEFELLER PLAZA, NEW YORK, N.Y., U.S.A

TMK81

RCA PHOTOPHONE LTD., 58 W. Regent St., Glasgow. Telephone: Douglas 4712. PERSONNEL—*District Manager:* A. V. Cappellaere. Products Sold: Theatre and Sound Equipment.

WESTREX CO., LTD., 141 Bath St., Glasgow C. 2. Products Sold: Westrex Corp. line.

SOCIETY ISLANDS

ESTABLISSEMENTS DONALD TAHITI, Papeete, Tahiti. Products Sold: RCA Theatre and Sound Equipment.

SPAIN

WESTREX CO., IBERICA, Avenida Jose Antonio 636, Barcelona. Products Sold: Westrex Corp. line. AREA SERVED—Spain, Gibraltar, Tangier and Spanish Morocco.

C. & G. CARANDINI S.A., Avenida Jose Antonio 31, Madrid.

INDUSTRIA ELECTRONICA, S.A., Calle Mayor 6, Madrid. Products Sold: RCA Theatre and Sound Equipment.

SWEDEN

SVENSKA VIDEO AKTIEBOLAG, Norrlandsgatan 18, 3 tr., Stockholm. Products Sold: RCA Theatre and Sound Equipment.

WESTREX SCANDINAVIA, AKTIEBOLAG, Sveavagen 25-27, Stockholm. Products Sold: Westrex Corp. line. COUNTRIES SERVED—Sweden, Norway and Finland.

SWITZERLAND

VICTOR FILMS LTD., Schutzenmattstrasse 43, Basle.

WESTREX CO., ALPINE, Viaduktstrasse 60, Basle. Products Sold: Westrex Corp. line.

JACQUES BAERLOCHER CORP. FOR ELECTRONIC PRODUCTS, Nüscheler-strasse 31, Zurich. Products Sold: RCA Theatre and Sound Equipment. COUNTRY SERVED—Switzerland.

TASMANIA

WESTREX AUSTRALIA PTY., LTD., 38 Elizabeth St., Hobart. Products Sold: Westrex Corp. line.

THAILAND (SIAM)

BARROW, BROWN & CO. (1948) LTD., Barrow, Brown Bldg., Bangkok. PERSONNEL—*Manager:* C. H. Hinton. Products Sold: RCA Theatre and Sound Equipment.

K. K. TSAN, P. O. Box 141, Bangkok. Products Sold: National Theatre Supply Line.

WESTREX CO., ASIA, 989-991 Silom Road, Bangkok. Products Sold: Westrex Corp. line.

TUNISIA

STE. LEO VOGELWEITH, Rue Garibaldi, Bizerte. PERSONNEL—*Manager:* A. Guérinel. Products Sold: National Theatre Supply Line.

*Listing not confirmed by Supply Dealer

WESTREX CO., FRANCE-BELGUIM, 4 Rue de Vesoul, Tunis. Products Sold: Westrex Corp. line.

TURKEY

TEKNIKA, T.A.S., P. O. Box Galata 153, Instanbul. Products Sold: RCA Theatre and Sound Equipment. COUNTRY SERVED—Turkey.

UNION OF SOUTH AFRICA

AFRICAN CONSOLIDATED FILMS, LTD., Head Office: Broadcast House, 170 Commissioner St., Box 4552, Johannesburg. Branches: Cape Town—26 Commercial St., Box 701. Port Elizabeth—Grand Theatre, Main St. Box 347. Durban—Theatre House, 9-11 Melbourne Road, Box 2352. Bulawayo—Palace Theatre, 11th Ave., Box 537. Nairobi—Capitol Theatre, Box 2682. PERSONNEL—N. Bennett, R. H. Jameson. Products Sold: National Theatre Supply Line, RCA Theatre and Sound Equipment, G.B.-Kalee. AREA SERVED—Africa, South of Equator.

WESTREX CO., EAST, Express Bldg., Fox and Nugget Sts., Johannesburg. Products Sold: Westrex Corp. line. AREA SERVED—Union of South Africa, Northern and Southern Rhodesia, Belgian Congo, Portuguese East and West Africa, Tanganyika, Uganda, Kenya Colony, Zanzibar, Angola.

URUGUAY

*H. GARCIA AROCENA, San Jose 1202 Esq. Cuareim, Montevideo.

CINEMATOGRAFICA GLUCKSMANN, S.A., Rio Branco 1320-26, Montevideo. PERSONNEL—*Owner and Manager:* Bernardo Glucksmann. Products Sold: National Theatre Supply Line. COUNTRY SERVED—Uruguay.

VENEZUELA

NATIONAL SUPPLY, S.A., Gorda a Asserradero 32/34, Caracas. PERSONNEL—*Manager:* Augusto M. Matilla. Products Sold: National Theatre Supply Line.

STANDARD ELECTRIC, S.A., Bloque 6, Local 6, El Silencio, Caracas. PERSONNEL—*Manager:* José Castañeda. Products Sold: RCA Theatre and Sound Equipment. COUNTRY SERVED—Venezuela.

WESTREX CO., CARIBBEAN, Edificio Karam, Ibarras a Pelota, Caracas. Products Sold: Westrex Corp. line.

WEST INDIES

Aruba

E. DE VEER'S CHAIN THEATRES, P. O. Box 3, Aruba. Products Sold: National Theatre Supply Line.

Cuba

NATIONAL SUPPLY, S.A., Almendares #166, Filmcenter, Habana. Telephones: U-5237—(Emergency Night) F-3798. PERSONNEL—P. Saenz. Products Sold: National Theatre Supply Line. COUNTRY SERVED—Cuba.

STANDARD ELECTRIC, S.A., Almendares 168, Filmcenter, Habana. PERSONNEL—*President:* Edward E. Chisholm. Products Sold: RCA Theatre and Sound Equipment.

VINCENT VAZQUEZ, Accesorios Cinematografios, Calle Almendares No. 205, Filmcenter, Habana. Products Sold: Motiograph.

WESTREX CO., CARIBBEAN, Industria 307, Habana. Products Sold: Westrex Corp. line.

Curacao, Netherlands Antilles

EL LOUVRE, S.A., P. O. Box 138, Curacao. Products Sold: RCA Theatre and Sound Equipment.

N. V. BIOSCOOP MAATSCHAPPIJ CINELANDIA, P. O. Box 13, Curacao, N. W. I. PERSONNEL — *Directors:* Frank Brandao, Alfred Moron, Jr., Michael Herbert Pinedo. Products Sold: National Theatre Supply Line. AREA SERVED—Curacao.

Haiti

SOCIETE HAITIENNE d'AUTOMOBILES, Mallenbranche, Gentil Bogat & Co., Port-au-Prince. Products Sold: RCA Theatre and Sound Equipment.

Jamaica

PALACE AMUSEMENT CO. (1921) LTD., P.O. Box 211, Kingston. PERSONNEL—*Managing Director:* V. P. Powell. Products Sold: Gaumont-Kalee, G. B., Bell and Howell.

RUEL SAMUELS, 34 Port Royal St., Kingston. Products Sold: Westrex Corp. line.

Puerto Rico

EDUARDO G. GONZALEZ, P. O. Box 3871, San Juan. PERSONNEL—*Owner:* Eduardo G. Gonzalez. *General Manager:* Lister Belaval. Products Sold: National Theatre Supply Line. AREA SERVED—Puerto Rico.

WESTREX CO., CARIBBEAN, Film Center Bldg., 1524 Ponce de Leon Ave., San Juan. Products Sold: Westrex Corp. line. AREA SERVED—Puerto Rico, Dominican Republic, Virgin Islands.

Trinidad

SPORTS & GAMES, LTD., 28 Henry Street, Port of Spain. PERSONNEL — *Managing Director:* H. E. Ames. Products Sold: RCA Theatre and Sound Equipment. AREA SERVED—Trinidad, Tobago.

GLOBE THEATRES, LTD., Port of Spain. Products Sold: National Theatre Supply Line.

MASONS & CO., LTD., 2 and 4 St. Vincent St., Port of Spain. PERSONNEL—F. R. G. Wrigley, AMIEE. Products Sold: Gaumont-Kalee. AREA SERVED—West Indies excluding Jamaica.

NATIONAL UNION RADIO SERVICE, 9 Cornelio St., Port of Spain. PERSONNEL—*Owner and Manager:* J. H. Fung. Products Sold: National Theatre Supply Line, Lorraine Carbons. AREA SERVED—Trinidad, British Guiana, Venezuela.

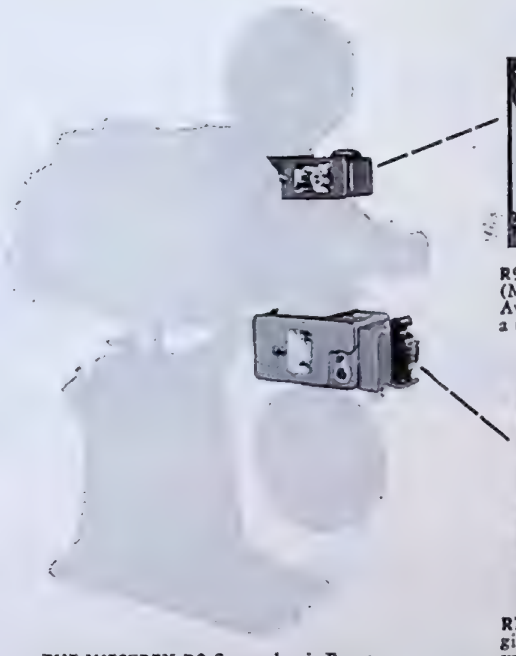
WESTREX CO., CARIBBEAN, 9-11 Edward St., Port of Spain. Products Sold: Westrex Corp. line. AREA SERVED—Trinidad; Barbados; British, Dutch and French Guianas; Leeward and Windward Islands.

TOP CHOICE—EVERYWHERE!

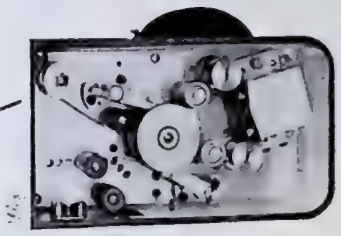
THE WESTREX Multi-Channel and Single Channel Sound Systems

FOR THEATRES OUTSIDE U.S.A. AND CANADA...FOR STUDIOS EVERYWHERE

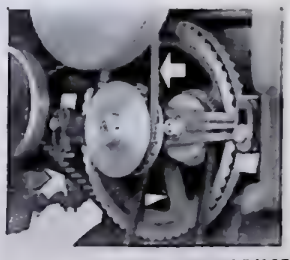
FOR THE STEREOPHONIC ERA there is a new, complete and thoroughly proved Westrex line of theatre sound systems for multi-channel magnetic (such as CinemaScope), multi-channel photographic (such as Perspecta Sound), and single channel reproduction (standard photographic). When these modern systems are installed, adjusted and serviced by Westrex Corporation engineers, finest performance and lowest overall cost are definitely assured...Write today for complete information about the particular system in which you are interested.



THE WESTREX R9 Stereophonic Reproducer (Magnetic) and R7 Photographic Reproducer.



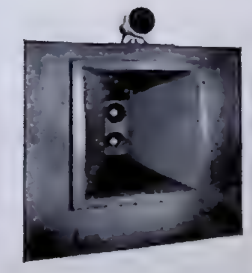
R9 STEREOPHONIC REPRODUCER (Magnetic) brings you the Academy Award winning hydro flutter suppressor, a tight film loop, and double flywheels.



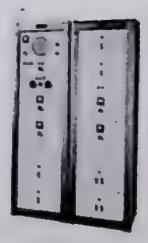
R7 PHOTOGRAPHIC REPRODUCER gives unsurpassed reproduction from variable area and density prints. Special noiseless timing belts are an exclusive feature . . . will not slip or stretch.



THIS INTEGRATOR is essential for Perspecta Sound multi-channel reproduction from a standard photographic sound track on which control frequencies have been superimposed.



THE WESTREX T501A Stage Loudspeaker Assembly features the newly designed Acoustic Lens.



THE WESTREX AMPLIFIER CABINETS can provide up to four channels for either magnetic or photographic reproduction.



THE WESTREX T502B Stage Loudspeaker Assembly was designed for larger motion picture theatres.

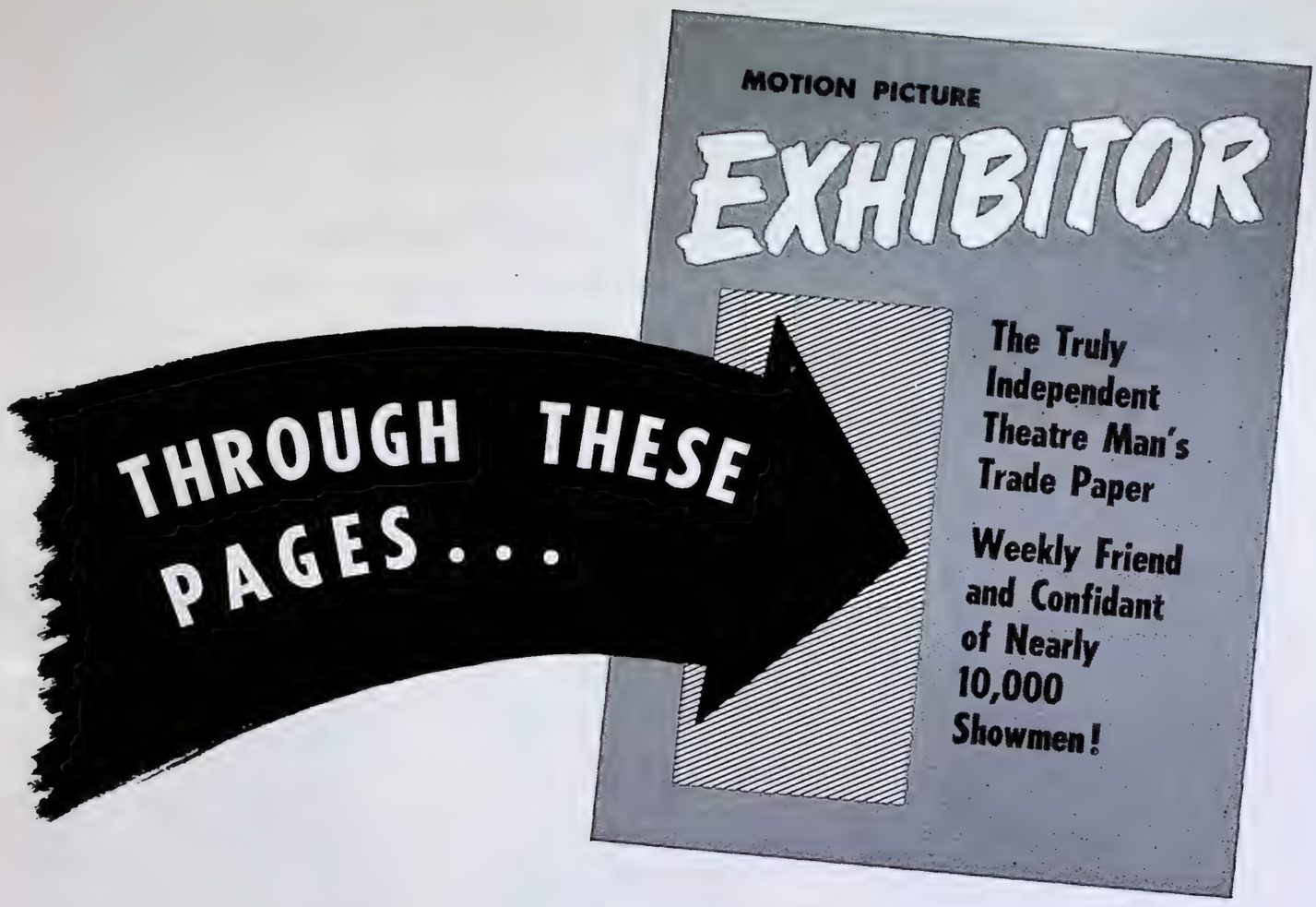
Westrex Corporation

RESEARCH, DISTRIBUTION AND SERVICE FOR THE MOTION PICTURE INDUSTRY

111 Eighth Avenue, New York 11, N. Y.

Hollywood Division: 6601 Romaine Street, Hollywood 38, Calif.

FORMERLY WESTERN ELECTRIC EXPORT CORPORATION



* pass the industry's MOST COMPLETE and MOST HONESTLY FACTUAL reviews of *every* feature of *every* short subject. This is the *only* complete reviewing service in the industry trade press!

YOU MAY PAY MORE . . . BUT YOU'LL NEVER BUY BETTER . . . IN MOTION PICTURE TRADE PAPER SERVICE!

MOTION PICTURE EXHIBITOR

EXTRA PROFITS

1954-55

Liquid Assets

Proper Equipment and Correct Sales Approach Can Make Beverages One of the Most Popular, and Profitable Concession Stand Items

BRIEF: ***It has been proven that today more than 70 per cent of the theatres in this country serve and sell some sort of beverage . . . It has been proven that a refreshing drink is something that pleases the theatre-going public . . . and is a healthy source of income for the theatre . . . This article discusses beverage sales as they apply to the motion picture theatre . . . There is information about the different types of dispensing equipment . . . and where each would be most suitable . . . There are hints on how to serve beverages so as to get the greatest amount of sales volume . . . Such subjects as storage . . . merchandising . . . and stock control are also given attention.***

The theatre operator who would like to know more about beverages . . . and how he might get a greater return from this popular concession item . . . will find this article to be of particular interest and value.

In the booming business that theatre concessions have become in recent years, nothing plays a bigger part than "the beverage." Sold ice-cold, red-hot, lukewarm . . . in cup or bottle or glass . . . indoors and outdoors, upstairs and down . . . "the beverage" is important to the customer and the house owner alike. Let's be specific.

Recent surveys of the industry indicate that roughly seven out of 10 theatres handle beverages for the enjoyment of their customers and the increase of their profit statements. Some of the conventional houses feature elaborate dispensing sections as a part of their refreshment stand operation; some rely on automatic vending machines; many have both. In the drive-in theatre, the beverage service at the snack stand is frequently supplemented by push-cart service at the window of the automobile. Everywhere, theatre patrons show their approval by buying more . . . and more . . . and more beverages while they enjoy the movie program.

Growth and Profit

How has this situation come about? In the years before World War II, refreshment service in the average American theatre was largely limited to vending equipment which served cigarettes and candy bars . . . plus popcorn machines handled with their left-hands by ticket-takers. The public . . . and the alert exhibitor . . . have changed all that. A trip to the theatre these days is a complete entertainment experience. It is expected to include not only a satisfying feature film and a selection of shorts, but a variety of quality refreshment items, readily available and attractively merchandised.

In other words, the theatre-going public wants refreshment with its entertainment. It has established this fact beyond question by making the concession operation a half-billion dollar annual business.

In locations where the exhibitor has reacted aggressively to this demand for additional service, the rewards have been rich indeed. On an industry-wide basis, more than six of every ten patrons make a purchase at the refreshment stand in the conventional theatre. The drive-in snack stand does business with seven out of ten customers who come to see the show! For every dollar taken in at the ticket window, the



A WELL organized concession stand, such as the one seen here, results from the proper display, and advertising of the stand's merchandise.

refreshment counter pulls in an additional 26 cents indoors, a whopping 45 cents at the drive-in.

Beverages Popular

Following closely on the heels of popcorn in customer preference at the refreshment stand come cold drinks. (Hot drinks . . . coffee, hot chocolate, etc. . . . are just beginning to make inroads on the beverage business, particularly in the cooler sections of the country. They are, however, limited almost entirely to the drive-in theatre.)

More than 80 per cent of circuit indoor houses and over 60 per cent of independent operations now sell beverages. Outdoors, the booming beverage business is a rule, with almost 100 per cent of the theatres making drinks available to their customers.

Coca-Cola is by far the most popular beverage offered, appearing as a featured item in more than 50 per cent of all theatres, indoor and out. Root beer is offered in one-third of the houses, and is second favorite. Fruit-flavored carbonated beverages appeal to roughly one-fifth of the customers, and after these come still-water fruit beverages, milk drinks and frozen fruit concentrates.

Equipment Important

As indicated earlier, the basic beverage business is done at the refreshment stand, both in the conventional theatre and the drive-in. The multiple-drink cup

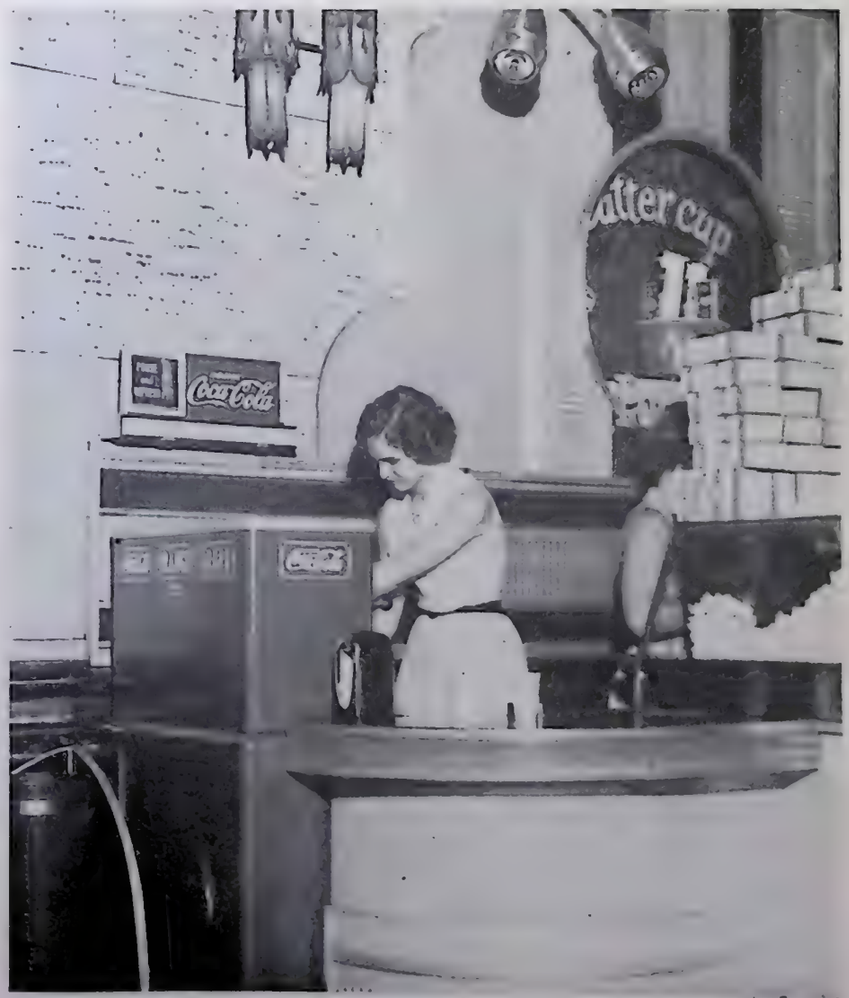


A COURTEOUS, friendly attendant, such as the one seen (above) can help boost sales. Careful placement of refreshment stand units (below) makes for more sales of everything at the stand.



DISPENSING equipment should be iced (above) to pre-cool the syrup. Stand manager (below) must see that the oldest dated syrup is used first.







ANOTHER typical beverage department (above) at a modern theatre concession stand. Attractive display materials (below) help to direct attention to your beverage service and helps boost sales.

machine, (which dispenses Coca-Cola, a carbonated fruit drink and a still-water drink, for example) is the most popular unit for the average indoor house, and is likely to be found in secondary locations throughout the theatre as well as tied-in with the snack stand. At the larger stand, and in increasing numbers of drive-in operations, the self-contained unit which handles Coke and root beer and one or more fruit flavors, is becoming the accepted norm. Some few of the larger plants feature complete soda fountains.

The size and type of business done by the drive-in concession stand . . . and the refreshment center in the mammoth, first-run indoor house . . . make it desirable to use the fastest and most effective equipment available in the dispensing of beverages.

Dispensers for Coca-Cola, as an example, deliver 115 drinks of uniform quality to the gallon of syrup, returning a gross profit spread of almost four dollars at five cents per 6-ounce drink. By using a dispenser, the concessionaire gains uniform quality in the drink he serves. He gets away from the necessity for drawing from more than one tap, and he avoids the danger of flatness in the drink from over-stirring. He combines his service operation in one handsome, practical piece of equipment that even the newest employee can operate perfectly. He simplifies his dis-





BEVERAGE syrups should be kept in cool, dry places (above). Where large freezers (below) are available, beverage syrups should be pre-cooled.



pensing operation, speeds up service, and, of course, increases his profit. Where it is not practical to use a single-drink dispenser, the multiple-beverage unit is capable of a good job, and of delivering quality drinks.

Two Trends

It goes without saying that quality equipment should be used for the dispensing of all beverages. Such equipment is usually easy to clean and maintain, and comes complete with manufacturer's instructions. They should be studied and followed closely by refreshment stand personnel for maximum service from the equipment.

Two trends within the beverage department of the concession operation have gained prominence within the past couple of years, and are worthy of extra mention. One is the definite move in the direction of larger unit sales (the 10, 15, 25, 30-cent cup) and the other is the increasing demand for thoroughly refrigerated beverages.

Many exhibitors report that even when placed in direct competition with smaller-priced cups, the larger drinks now appeal more to the public and result in heavier sales. This trend has



THE multiple-drink cup machine is the most popular method of dispensing beverages in the conventional theatre. Usually placed in the lobby.

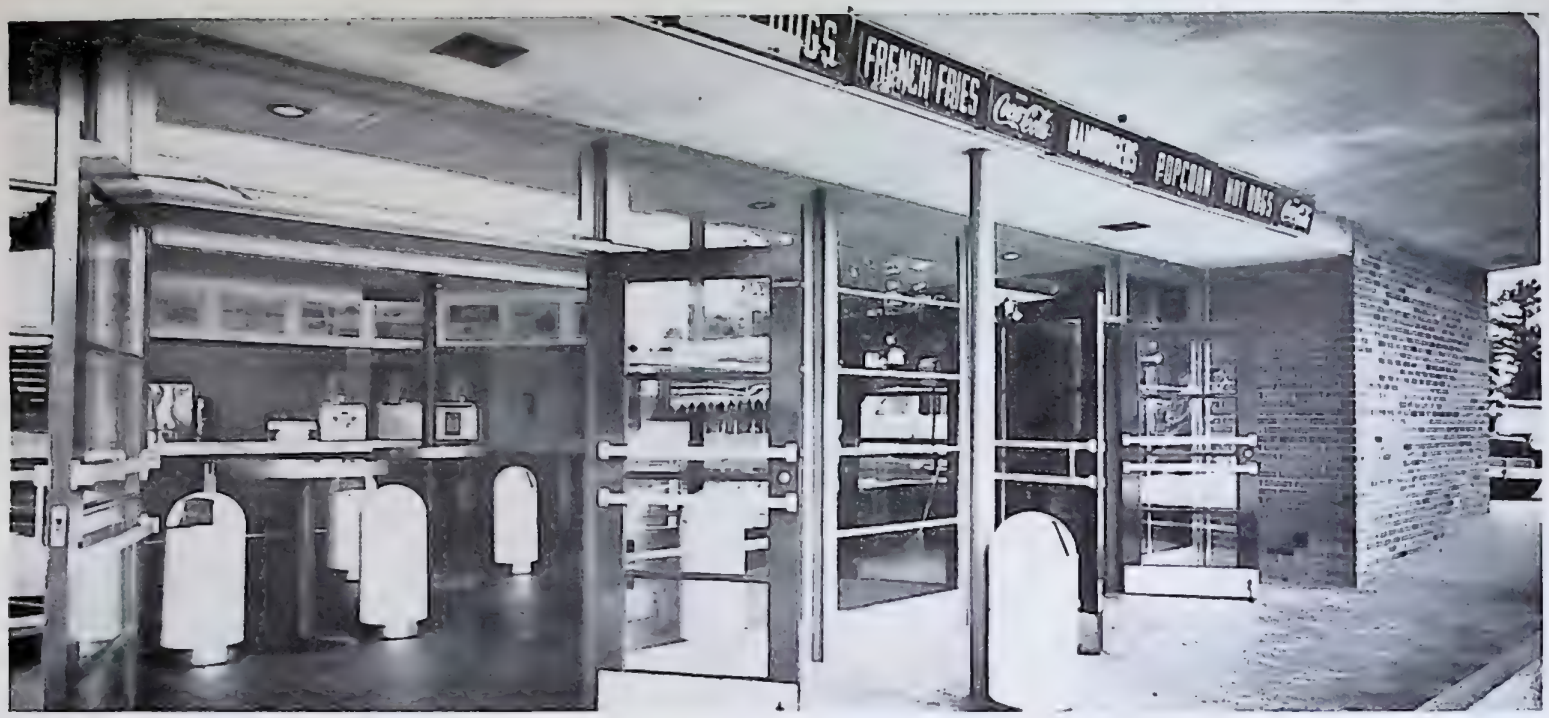
brought along its own peculiar problems (such as quality-control) but should be watched.

The demand for refrigeration, on the other hand, is an old story given a compelling new twist. Beverage manufacturers have for many years urged that their products be served at 40 degrees . . . or colder . . . for maximum enjoyment, but consumer preference has now given added impetus to the message. In 1953, for example, concessions people reported gains in beverage business from 20 to 50 per cent after they started putting ice in their cups. Originally made to be enjoyed ice-cold, a beverage obviously becomes more desirable when it is served ice-cold. And ice in the cup retains the coldness in the drink until it is consumed.

CARBONATOR TROUBLE CHART

CAUTION: Avoid Injuries By Always Cutting Off Power Before Working On Carbonator.

Trouble	*Cause*	*Remedy*
No carbonated water.	Water supply shut off.	Re-establish source.
	Air-bound water pump.	Vent pump.
	Worn pump checks.	Replace.
	Clogged water inlet screen.	Clean.
	Clogged filter.	
Flat carbonated water.	Gas drum empty or low.	Connect full drum.
	Gas turned off.	Turn on gas.
	Regulator gauge set too low.	Increase gas pressure.
	Gas line closed by smashed washer	Replace fiber washer.
	Broken agitator shaft.	Replace.
	Agitator sprocket or pulleys loose.	Tighten.
	Water pressure too high (over 50 pounds).	Adjust if possible or install pressure reducer.
Metallic taste.	Block-tin lining damaged.	Repair lining.
	Carbonated water backing up into city water line.	Clean water back-pressure check valve, replace washer.
	Carbonated water line connected by mistake to brass or copper water coils instead of block tin.	Make proper connection.
Carbonated water off taste.	Oil, dirt or grease inside carbonator.	Clean carbonator.
	Tainted gas.	Sniff gas at drum head to determine if drum should be replaced.
Milky carbonated water.	Air in carbonator.	Vent carbonator.
	Pump sucking air.	Adjust pump packing.
Gas flows from draft arms.	Water turned off.	Turn on.
	Electric motor not cutting on.	Call electrician.
	Water pump failure.	Repair pump.
Carbonator fills with water.	Water pressure too high.	Adjust if possible, or install pressure reducer.
	Gas pressure too low.	Set regulator key to deliver proper gas pressure.
	Gas drum empty.	Replace.
Carbonated water backs up into city water line.	Dirty or worn back-pressure check valve.	Clean or replace valve seats.
Carbonator fails to cut on or off automatically.	Balancing rod pivot screw frozen.	Free and oil pivot screw.
	Balancing bucket hoses twisted.	Straighten hoses by lining up seams.
	Switch blade pivot frozen.	Free and oil pivot screw. Clean blade contact.
	No contact.	Clean corrosion from knife and fork contacts of switch with fine sandpaper or emery cloth.
	Clogged hose.	Uncouple and blow through hose.
	Trip rod out of adjustment.	Check adjusting nuts on trip rod for "on" and "off" switch control.
Excessive pumping.	Closed water supply valve.	Open valve.
	Water supply (building or city) shut off.	Re-establish source.
	Automatic switch out of order.	Check switch or call electrician.
	Interference with operation of balancing bucket.	Remove interference.



ATTRACTIVE outside display material beckons the drive-in customer to the concession stand where he should find a variety of foods and beverages.

The sales ability of beverages should not be underestimated, since, next to popcorn, drinks are the most popular item in the concessionaires line.

Merchandising

Proper merchandising of beverages also stands to increase their sale at the refreshment stand. Many of the larger suppliers (such as The Coca-Cola Company) furnish, free of charge, elaborate promotional material running from film intermission trailers—to display pieces —to reminder signs. Attendants add a great deal to the promotion of certain items by suggesting them to customers. And in many instances simple placement of beverage dispensing equipment in close proximity to hot dog grill or popcorn machine increases the sale of both items.

A WELL merchandised snack bar lures the hungry drive-in theatre customer to spend more money. Merchandise should be well-displayed, attractively advertised so the patron may see what he wants.



Stock and Storage

Many operators order and take delivery of beverage syrups in large quantities on the theory that slight savings thus effected make the practice desirable. This is definitely not the case. Beverage syrups should be bought a week's supply at a time, on the same day every week. Like other fine food products, syrups should be protected against the natural hazards of heat and storage. For that reason, and to insure top quality drinks at all times, a week's purchase at a time is highly desirable.

When delivered to the theatre, beverage syrups should be stored in a clean, dry place away from hot-water pipes, steam lines, etc. It is recommended that syrup bearing the oldest date of manufacture be placed to the front of the storage bins or shelves, so that it will be used first. In this way, freshness of the syrup and of the drink dispensed to the customer is guaranteed.

The Profit Story

Properly stocked, properly stored, properly priced and properly promoted, "the beverage" can play an important part in the financial life of the alert exhibitor. His patrons have proven on past performance that they want refreshment with their entertainment. The average theatre in the United States does more than 500 gallons of business a year at the beverage counter. Figured on the rate of return given him by Coca-Cola, the profit from beverages alone comes to $2,000 a year for the concession operator!

If he sticks to top-quality products . . . products nationally advertised, nationally known, nationally preferred . . . the job of turning stock into profit becomes a simple one for the theatre man with money on his mind.

Concession Merchandising

Proper Exploitation of the Angles at a Theatre's Snack Bar Will Mean an Increase in Extra Profits

By RALPH PRIES*
Berlo Vending Company

The motion picture business grew and prospered on merchandising. In fact, our industry coined a new word for it. Unfortunately many exhibitors have forgotten all about this word. It happens to be showmanship.

INTRODUCTION

Showmanship is the art of exploiting our wares to our potential customers, apprising them of the wonderful entertainment to be had in our movie houses, enticing them in with powerful campaigns and gimmicks designed to whet their appetites, and arousing their curiosity about our bill of fare. Certainly on today's market, with competition more keen than ever for the public's dollar, merchandising in the form of showmanship can still pay off.

BRIEF: ***The value of a theatre's concession business is by now fully appreciated by every exhibitor who has seen the color he used on his books change from red to black as a result of extra profit efforts . . . However a mere awareness of this fact will not increase this valuable source of theatre income . . . In this article the author offers an analysis of what is necessary in order to make the term extra profits mean something more than just an expression.***

Readers will find a discussion of proper merchandising approaches . . . discussion of point of sale . . . advice on stocking and display activities . . . and many other valuable pieces of concession stand information.

Many successful men who built their fortunes in the motion picture business did it through the use of showmanship. Today, your best tool in helping your business lies idle. All it needs is the application of a little brain power and muscle power to put it back in shining condition again, and it would serve you well if you would only begin once again to use it to the utmost of your ability. There are many facets of your operation that require effort and attention. Certainly they are all important but today's struggle for profit in our business, not just profit but in many cases survival as well, depends on how good a job we do. It behooves us then to channel our efforts in the direction that will do the most good.

That is in bringing in patrons.

Certainly, better pictures is the answer to our problem but there are only so many available today, and, irrespective of the good intentions of our producers, there will only be so many tomorrow, and the tomorrows that come after. All of you in your experience in this business can remember many pictures on which you made a flat buy, that returned to you many more dollars profit than most pictures that you have been forced to pay 50, 60, or 70 per cent for. Some of those pictures were not supercolossal but they were pictures that caught your fancy, pictures that had an idea that you translated into action, for which you built up a real case in exploitation. You livened up your business, and gleaned more profit dollars by using exploitation, advertising, showmanship, and merchandising!

Anything that detracts from the goal or purpose of bringing in more boxoffice dollars is hurting your theatre and your business. If your attendance falls, but through careful management, watching expenses, or by any stretch of the imagination, you are able to keep your profit constant, you are still in trouble. For it is only by creating regular patronage that you will be able to perpetuate this fabulous business in which we are all engaged.

Not only are you concerned about keeping your theatre open, but there are many neighboring merchants who depend upon the patrons who come to your theatre for business, who are vitally interested in keeping your theatres open. Certainly, we should draw on these people for help in keeping our business before the public. These people in your own community can be called on to boost your business by mentioning to your regular customers some of your fine pictures and the bargain in entertainment that they will get when they attend your theatre.

When you have a particularly good show, wouldn't it be good sense to give some of these neighborhood merchants passes to your theatre, bring them in, and let them talk about your good shows to their customers, and enlist their aid?

A CLEAN WELL STOCKED concession stand, such as this one at the Golden, Golden, Colorado, with an attractive sales force, are ingredients that help create a successful extra profits department.



*From an address before a Virginia exhibitor group.





SIGNS ON THE counter of the refreshment stand at Wometco's Parkway, Miami, Fla., left, called attention to popcorn's food values. At the right is a poster used in campaign.

Certainly, if they depend on you to the extent that most of them claim, they are very much interested in boosting you in any way that they can. Surely, there is no better way of merchandising your theatre and your pictures than by having lots of active salesmen in the field talking for you. Your neighborhood merchants are your best possible salesmen. Use them.

CONCESSION MERCHANDISING

How and where does concession merchandising fit into this picture, and how can it pay off for you? With a static patronage, rising cost of operation, and shrinking profits, refreshment profits loom larger today than ever before, and how to make them even greater is a matter of much concern and importance.

Your best efforts and energy directed into the channel of merchandising your theatre by bringing in more patrons, and our best efforts and energy directed into the channel of selling those patrons refreshment items once they come inside your theatre, makes up an unbeatable combination.

Point of Sale

In theatre concession merchandising, everything happens at the point of sale.

CONCESSION stand is used to help promote film at Fox West Coast Theatre, Long Beach, Cal.



A customer walks in the theatre, and then, for a fraction of a minute, his attention is either attracted or not by the refreshment unit. In a short minute or two, that customer is waited on, and so goes on to his seat. He is a satisfied customer.

Everthing we have to do in merchandising concessions happens to that customer in those two or three minutes. He sees our stand, and buys from it if we do a good job. How, then, can we best go about merchandising our product to take advantage of that short space of time in the life of your customer?

First consideration in doing a good merchandising job is the proper location of the proper type of concession equipment. Regardless of whether the theatre has a refreshment stand or uses only machines for vending concession items, it is imperative that the location be in the most conspicuous spot in the theatre, within the bounds of good taste and good operation. Experience has shown that a center standee rail location in most theatres will produce 100 per cent of the potential business, and in every instance we try and capitalize on the fact that that location will catch the most incoming traffic. Assuming that we are able to get the best possible location for our equipment, our next consideration is putting in equipment of the proper type, equipment that is clean, neat, attractive, colorful, bright, eye-catching. The design and decoration of the unit has lots to do with its sales ability, and even on a machine type of operation, the type of equipment used, the cleanliness and attractiveness of that equipment will determine to a large extent how much business it will do. Still, the crux of the above is that we must get the best location of the best type of equipment if we are going to, from that point, go on with merchandising refreshment items in a theatre.

Supervision

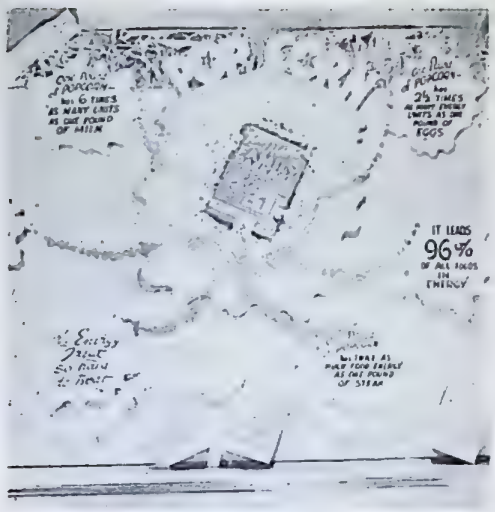
Supervision of operation would certainly rank second in judging the factors that go to make profitable, well-operated and orderly refreshment stands. The training of sales personnel in such important phases of operation as courtesy, cleanliness and neatness, proper stocking of merchandise, working in harmony with theatre personnel, stand display and decoration, and last, but not least, salesmanship in the art of promoting those items will produce the greatest sales volume and the greatest profit.

This supervision cannot just be casual, it must involve a training program for the sales help and constant checking to see that all the factors that we try and instill in those people are carried out to your patrons so that they become apparent to each customer in those two or three minutes that he is doing business at our little store.

The supervisor is trained to observe the unit and the sales person in action, so as to bring into the operation ideas and suggestions and criticisms that have been proven successful in other locations, and it is only by this constant checking and surveillance that the sales people and the stand can be kept in topnotch operating order. Let's take these items that go to make an efficient operation, and run through them one at a time to see

ANOTHER extra profits angle is selling tie-in products as done at the Boyd, Philadelphia.





INTERESTING display in lobby of Orpheum, Moose Jaw, Saskatchewan, helps to sell popcorn.

what is expected of your refreshment unit.

First, let's take courtesy.

All of us like to be waited on by a courteous sales person. It's that pleasant smile and welcoming "May I help you" that paves the way for a pleasant purchase. For the undecided, a tactful suggestion is never resented, and is in a great many cases the small extra effort that goes to build up additional sales volume. Then, upon conclusion of a purchase, don't we all like to hear a pleasant "thank you"? It costs nothing, and yet imparts a finishing touch to our small transaction. It leaves the purchaser and the seller as well a little bit better off mentally in having been in momentary contact. Certainly, these little pleasantries go to make up a smooth and efficient sales organization, and I assure you that these little amenities not only are warmly welcomed by your patrons at the refreshment stand, they would be equally welcome at your front door, where the cashier sells the ticket, and when your ticket taker collects it. These little things are so strangely missing in our business world of today. Where the policy of appreciating your customer is carried out, it is so noticeable as to create untold good will.

Cleanliness and neatness come next in our program of merchandising concessions. For we are selling goods that are to be eaten and consumed by the public. All of us like to go into a restaurant where we find sparkling silverware and glassware, and where the tablecloth is just freshly laundered. It paves the way for the enjoyment of our meal. Our refreshment stands are much the same way, for when we serve a customer candy, popcorn, or ice cream, he cannot help but feel a little more at ease and a little more pleased when he buys from a stand that is neat and sparkling and clean. This goes not only for the equipment itself but for the sales people, as well. Proper supervision directs these girls to have their hair neatly combed and in place with a hair net, to have a freshly laundered uniform, to have their nails clean and neat. All of the many items that go to make up a neat and attractive person, which, taken together with a neat and attractive stand, invites patronage, and assures receiving first-class merchandise from a clean, neat, orderly, and sanitary kitchen.

Stocking

Proper stocking of our refreshment stands is an important item. For nothing quite whets the appetite like a large mound of foodstuffs from which we are going to buy. A huge pile of fresh crunchy popcorn looks so inviting. When you contrast that thought with a few kernels of popcorn in the bottom of an empty warmer that might be the leftovers from the day before or the last of the heap, there can be no choice in our minds but to serve our customers from the heaped up, full warmer. The same thing applies to candy in the candy case. It is important that we keep it full, and that we display on top of the candy case additional items that we wish to promote, a big mound of them so that the customer knows that it is fresh stock (which, as you and I know, it always is). If we let it dwindle down to the bottom, the customer feels that he is buying stale merchandise, and he isn't so inclined to make that extra purchase that we are looking for.



ANOTHER display item that pays off is this animated circus poster from Nestles Chocolate.

Harmony in the theatre is a necessary part of our operation. The salesgirl at the candy stand should make it her business to get along with everyone in the theatre, the doorman, and the manager working together as a team, they can go much further, and certainly any cooperation that one is able to give the other will make for better relations all around, particularly when it comes to the planning for the opening of the stand.

Be sure the girl is in ahead of time, and have the stand well stocked, clean, and neat, and also for intermissions be sure that the girl is forewarned when one is coming up so that she can be prepared to handle the crowd at closing times or when there is a special show.

All of those things will help to pick up extra and additional sales that are so necessary to keep up volume and profit.

Last, but not least, we can profitably talk about salesmanship, the one commodity that even though we use it over and over again, it tends to improve with each sale. It doesn't tarnish or disappear. It acts as a catalyst to our business, much like the chemicals that are used in the

SPOTLESS stockroom of Strand, Milwaukee, with stock arranged for easy rotation to insure against spoilage, reflects the care that pays off in satisfied customers and increased income.



production of oils and gasoline. They don't wear away but they speed up the process, and produce more end product with more efficiency and more profit.

Just what do we mean by salesmanship at our stand, and what do we expect from these stand girls? In short, it means we want to sell the highest priced item to each customer that good taste will permit, and we want to sell the highest commission item to each customer that we possibly can. (That being popcorn.)

Display

How do we go about doing that? To begin with, the display of merchandise has a great deal to do with just what items are sold. Naturally, popcorn is the longest profit item in the stand, and we are all interested in promoting that to the best of our ability. So we should make the central theme of any decoration in the stand popcorn.

It can be done in a variety of ways, with posters and signs and popcorn boxes and cellophane bags of popcorn tied with red ribbons and a thousand and one little clever ways that popcorn can be prominently displayed so as to suggest solidly to the customer that he try our fresh hot popcorn.

Then, further, there can be an attractive display of dummy ice cream packages along with a suitable sign advertising that product. In candy there is a hot spot in the candy case that first catches the customer's eye when he comes into the theatre. In that section of the case, we naturally would like to display our highest-priced items so that the customer might very well choose a 25 cent or 30 cent item instead of a five cent or 10 cent item. So we display what we want to sell in the fashion that will best sell it. Of course, we want to take advantage of every possible section of the stand for display purposes. The backbar should be displayed using popcorn boxes, high priced candy items, or something else that we want to push, and the top of the candy case should be equally as well displayed. This area certainly lends itself to the pushing of one or two items, and, without cluttering up the stand and with a neat display, we surely should be able to promote the sale of an additional item to each customer.

Now with all of these silent suggestions working for us, it behooves our sales people to put into words that suggestion to attempt to sell each customer those items which we are so prominently displaying. Any customer who buys only candy is a potential popcorn customer. We have a constant drive on to keep the girls asking "Would you like a box of popcorn?" of those customers. When a customer asks for a box of popcorn, anyhow, the girls are instructed to say "15 cents or 25 cents." That suggestion encourages the customer to buy one of those sizes instead of the 10-cent size, which, of course, gives anywhere from a 50 to 150 per cent increased sale. So, with every move and every foot of space, suggestions are used visually and verbally to promote the sale of popcorn. The same sort of suggestive selling can be used with candy bars.

When a customer wants a Hershey bar, the girls are instructed to always try and sell the highest priced Hershey bar by offering it to the customer. Then even if the customer declines that bar, the girl can always offer the next higher-priced without actually dropping down to the lowest-priced bar. The extra five or 10-cent sale made to each customer by following the above promotional suggestive practices will result in a tremendous boost in concession grosses, a boost that on today's market we cannot afford to bypass.

Concession trailers and intermissions, outside of the stand and sales person, are the greatest source of volume producers that can possibly be used today. We have had wonderful results by using some of the recent Technicolor trailers in connection with a two or three-minute intermission to allow the patrons an opportunity to come back to the refreshment stand for a pause.

All of this business of concession merchandising takes time, effort, energy, and know-how, the same kind of effort and energy that go into merchandising your theatre and your movies to the public. Certainly, it is possible to do both but I dare say that each is, in itself, a full-time job, if done properly.

CONCLUSIONS

Speaking for a company that has specialized in nothing but concession merchandising for almost 40 years, I can tell you that by working with all the effort and energy at our command, we are doing the job in over 2000 theatres in this country, and yet every day we find that further intense effort enables us to bring our sales even higher. I know that your own effort directed at bringing in customers to your theatres can not be better spent if you are going to remain in the theatre business.

Our concession operation depends exclusively on your theatre operation, and, if you do a good job, it gives us the opportunity to do even a better job. Together, we can go a long way yet in this business. Our theatre business is still strong and hard hitting. Its potentiality is great. Together, we can do a wonderful job of perpetuating this fascinating business.

THIS HANDSOME open-counter refreshment stand at the Metropolitan, Winnepeg, Manitoba, is a reason why the theatre is a top seller of concession items in the Famous Players Circuit.



Concessionaires Vs. Self-Operation

The Advantages of Both Types of Management in Extra Profits Departments Are Carefully Treated by an Expert in the Field

By PHILIP KATES
Theatre Confections

BRIEF: ***Both the newcomer to the field . . . and the veteran theatre operator can find himself in the position where he has to decide whether or not it would be wiser . . . and more economical . . . to operate his own concession department . . . or leave it in the hands of a concessionaire . . . This article attempts to evaluate the advantages and disadvantages of each of these operations . . . The author . . . who has had many years of experience in the concession field . . . makes a strong case for each of these methods . . . and points out that individual situations may require different treatment.***

There are many valuable pointers and guides to successful concession stand operation to be found in this article . . . and it is well worth the attention of any indoor or outdoor exhibitor who finds himself debating about the merits of self-operation or the use of a concessionaire.

Just five years ago the results of a survey showed that by far, the large majority of theatre owners preferred to run their own concessions. A similar survey taken in 1954 in New York State shows that over 80 per cent of the drive-in theatres use a concessionaire. There certainly must be some worthwhile reason for this tremendous change in a five year period.

One of the most common thoughts of a newcomer to the theatre business, or of a complete outsider, is "Why does a theatre man need a concessionaire? Why can't he take care of his own business?"

We find that the progressive theatre man, the more experienced he is and the more he seems to learn about his business, will become more inclined to turn over the concession to someone else. What is the reason for this? Why does the theatre man need a stranger in his midst when on the surface it seems he would be much better off in taking care of his own business?

One of the reasons is that when a theatre man decides to build a new drive-in theatre, he has enough problems figuring out the construction and the layout of the theatre itself.

We cannot overlook the fact that the building of a theatre is costly and blunders even costlier. It certainly is helpful to be able to rely on a concessionaire who can give him definite and experienced advice as to where the concession should be built, how to build it and how to handle the general layout of it.

Even though the theatre owner would know how to build his own concession, there are many detailed problems which are important. Some of those problems are as follows:

1. Where the various outlets should come in.
2. The building of the counter.
3. The shape of the counter.
4. The type of flooring and wall covering to be used.
5. To what extent does the law permit grills and similar equipment near the public.
6. Entrance and exit rules.

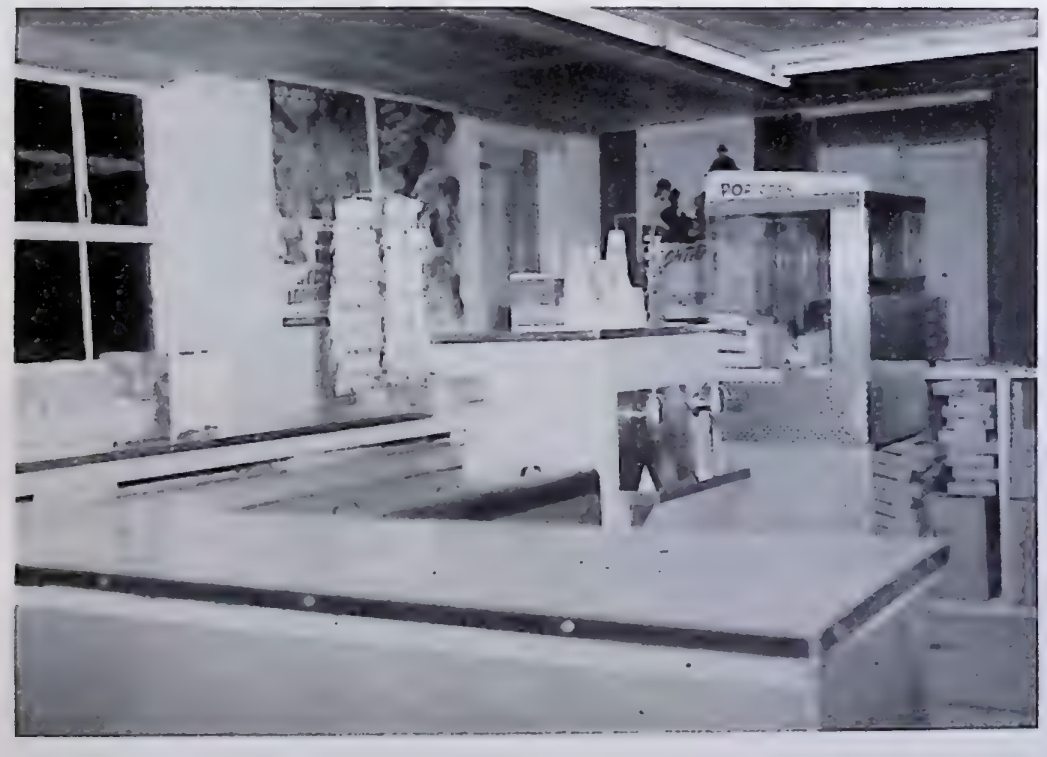
All of these and many other small details can be worked out with a concessionaire because of his previous experience with these problems.

THE DEL SEGO Drive-In, Oneonta, New York, had its concession building converted into this modern and profitable place by concessionaires.





CONCESSIONAIRES know how to properly equip a concession stand such as at the Endwell Drive-In, Endwell, N. Y. (above). The stand at the Franklin Drive-In, Malone, N. Y. (below) is compact and modern



Take the possibility that the theatre man has been able to construct a suitable building and has been able to furnish it properly inside. Then some of the problems that come along are:

1. The type of equipment to buy.
2. What gas equipment and what electric equipment to be used.
3. Are the lines heavy enough to carry the electric load.
4. Is the water pressure strong enough to serve the drink units during the rush hours.

Even after all of these problems have been conquered, others occur such as purchasing the proper supplies at the right prices. Here is where the concessionaire has the strongest point. He has suitable means to buy high quality merchandise and because of his great purchasing power and experience, his cost can be greatly reduced so that in the final analysis, he is able to turn over to the theatre owner, a greater profit than he could possible make on his own. This is in addition to the tremendous advantage of not being burdened with the hundredfold details that are entailed in the running of a concession properly and efficiently.

Best Equipment Cheapest

When building a new theatre, even the financially secure exhibitor will sometimes be concerned over the tremendous cost of the construction today and, somehow, when it comes to the concession, he feels it is time to bring his cost down. The concessionaire is conscious of money, yet has learned that the best equipment is the most effective equipment and, therefore, the cheapest in the long run.

Because of the final burden of building a theatre plus equipping the concession, the theatre operator will often welcome the vital financial help that the concessionaire will sometimes be willing to give for the privilege of operating such concession at the theatre.

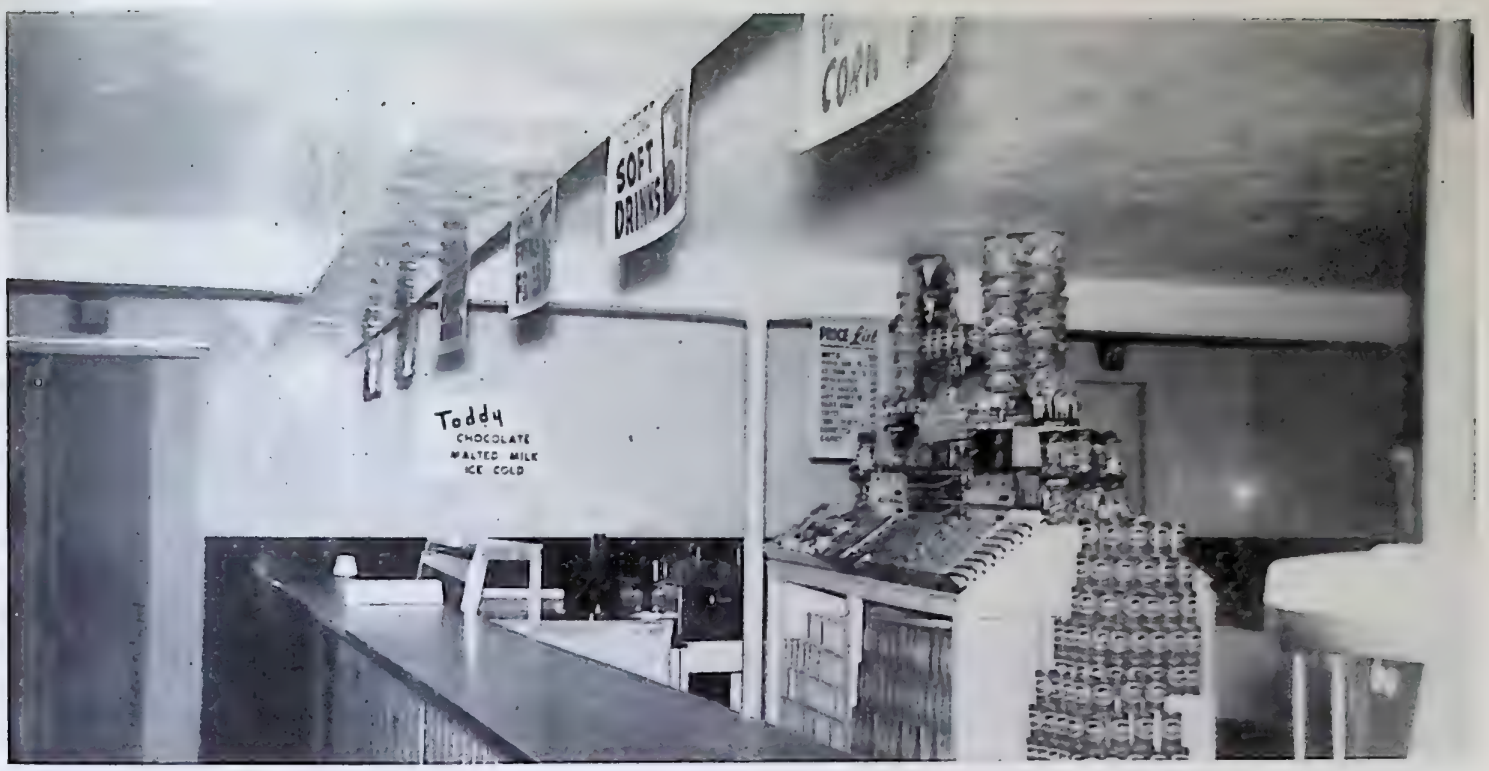
These are just a few of the benefits of having a concessionaire when a new theatre is built.

However, in addition to that, over the recent years, there have been found many theatre men who have been running their own concessions, who turn to a concessionaire to take over this part of the business. Why do they do this?

First, of all, drive-in theatres today, more than ever before require showmanship. Showmanship means constant attention as far as advertising, promotion and the various incentives and gimmicks that are used to get the customer in your theatre rather than for them to go somewhere else. Naturally, by having to divide attention between the concession and the running of the theatre itself, neither receives full justice. It is not infrequent for a concessionaire to come along and after analysing the figures of the theatre and the operation of the concession, to readily consent to equal or increase the profits of those made by the theatre man in his own operation in previous years.

Makes Good Sense

Therefore, it only makes good business sense to hand over to someone else such operation that is ultimately bound to show more profit and be a greater asset to the theatre and at the same time, give the theatre man more time to promote his own theatre and nothing else as well as more time to enjoy and



THE STAND at Front Drive-In, Binghamton, N. Y. (above) features continuous fluorescent lighting and the equipment built into the counter. A typical small theatre stand is seen (below) at Sunset D-I.



reap the profits of both operations without being unduly taxed with the many details that are entailed in order to do justice to both operations.

America has made great progress in recent years by the ability to delegate the various phases of our work to men suitable in their particular field. No longer do we bake our own bread or make our own shoes or clothes. For, each in his own field can make it a great deal better and do it a great deal cheaper by devoting his time to his own particular phase and this certainly holds true in the concession field also.

The following is, in short, the story of the concessionaire:

1. When a new theatre is built, he is able to assist the theatre man in building the right type of building in the right location.
2. He is able to furnish the interior as well as the exterior with the proper and decorative coverings and counters and signs.
3. He is able to equip the concession with the newest, most modern equipment available.
4. He knows the type of merchandise that is most suitable for the theatre patrons.
5. He has the proper connections in carrying high quality goods most adaptable for quick service.
6. He has the proper service organization so that the concession is constantly supplied amply without being overstocked.
7. He has the facilities to use experienced help as well as train new help.
8. He has enough supervisory personnel to check and control such operation so the above methods will be properly carried out.
9. He has very valuable and compact inventories and reports which will assure the theatre owner as well as the concessionaire that every dollar taken in at the concession is fully realized.
10. He has the facilities and service organization to keep the manifold and sometimes complicated equipment in proper working order.
11. He has the experience for right promotions and the various gimmicks that will help increase the volume and mean more business to both.

In the final analysis, all of these things mean a better operation, more prestige and more profit.

Advantages of Self-Operations

While to some it may seem an advantage to be able to dispose of the problems and details of the drive-in concession to a concessionaire, to others it is a challenge to be able to conquer their own problems. In that way, they are judge of their own mistakes.

While it may be true that by handing the concession over to someone else their work will be less complicated, on the other hand, you cannot compensate a person for being able to run his own business and do as he pleases. Many of us may do better and have an easier life by working for someone else, yet we choose the hard road of being on our own because we like our independence and freedom of movement. This, to some extent, is the first advantage of running your own concession.

It is a challenge to be able to figure out and plan in your own way, and

according to your own means, the building of the concession. Sure, some blunders may occur, but we all learn through experience and as time goes by, the theatre owner will be able to rectify his mistakes by trial and error.

If your drive-in theatre is in a highly competitive situation and you feel that you must do many extra things which may not be profitable at the moment, but eventually will help you to get more customers into your theatre, you may sell your various commodities below the regular and accepted prices in other theatres, or you may carry items that may be suitable for your particular theatre alone.

You may find, in order to get new customers or take customers away from your competitors, that you want to give away certain things such as candy to children, a free cup of coffee or use many other promotional ideas that have been tried from time to time.

You may feel, in order to give your customer better service, that you want to use extra help during your rush periods to give your customers that extra service that they cannot get elsewhere.

Finally, you may want to use your concession as a special booster to get customers.

These are things your concessionaire could not do for you, or may not be willing to do for you, whereas, on your own, you can do as you please and even though some of these ideas may not always work as successfully or profitably at the moment, in the long run, to the theatre owner, they may seem important.

Your help is another important factor and sometimes a saving in running your own concession. You are able to use the same help that is already working at the theatre so that they can also work part time at the concession. Or you may want your wife or other immediate members of your family to work at the concession for you which saves you paying out extra money to outside help. All these problems you may not be able to work out with a concessionaire.

In the final analysis there is no compensation for being your own boss and being able to do as you please, may it be right or wrong, profitable or otherwise.

The following is, in short, the advantage of a self-operation:

1. **If your funds are limited, you may build a small concession within your means.**
2. **You may change and replace equipment as you see fit over the course of time.**
3. **You can watch your competitors and copy or change their system of operation as you see fit.**
4. **You can carry items which may not be generally accepted for theatres, but you may feel they are suitable for your particular locality.**
5. **You may carry merchandise that might not be profitable to a concessionaire but still an asset to your concession.**
6. **You may undersell your competitors even though it may not be particularly profitable to you.**
7. **You can keep your stand open to the end of the show as an extra service to your customer, which the concessionaire would not find profitable.**
8. **You can use extra means of selling supplies through the boxoffice or moveable stands during busy periods which may not be particularly profitable from a business standpoint, but will be of extra service to your customers.**
9. **You can economize on help by using them part time for the theatre and part time for the concession.**
10. **You can employ your wife or other immediate members of your family and in that way keep your payroll cost down.**
11. **You can have certain give-aways at your concession such as candy for children or a free cup of coffee with a hot dog. A concessionaire would not find it profitable to do this.**
12. **You don't have to keep detailed records and inventories or reports, especially if your own family handles the concession.**
13. **You may use promotional ideas or give-away prizes at the concession which would not be profitable for the concessionaire.**
14. **You can use your concession as a drawing card or promotional outlet in order to get more customers in your theatre.**

As in all things in life, it is difficult to generalize. Some theatre owners find a concessionaire is the answer to their problem and others will be able to prove, and rightly so, that you cannot beat the advantages of a self-operation. Each is right in his own way.





THE STANDS at the Moonlight Drive-In, Potsdam, N. Y., (above) and the Riverside, Ogdensburg, N. Y., (below) are self-operating. This type permits economies not always possible with concessionaires.

turn a few *square feet* into a nice *round profit!*



When you install vending equipment for Coca-Cola in a few square feet of lobby space, a nice round profit starts to show in your ledger. That's because theater patrons from coast to coast have become accustomed to enjoying refreshment with their entertainment. Ice-cold Coke, of course, is *real* refreshment. It's a real profit-maker, too. For the details on a wide variety of vending equipment, get in touch with The Coca-Cola Company, P. O. Box 1734, Atlanta, Georgia.

"COKE" IS A REGISTERED TRADE-MARK

THE **BIG** SWITCH FOR DRIVE-IN OPERATORS IS TO BERLO'S A-B-C PLAN



A. NEW IDEAS! Berlo's vast experience and continual growth brings new ideas to your concession.

B. TRAINED SALES HELP! Berlo's experts train and supervise your sales help.

C. STOCK AND CASH CONTROLS! Berlo's careful control of stock and cash leaves no margin for error.

BERLO'S MERCHANDISING METHODS DELIVERS THE HIGHEST PER CAPITA SALES IN THE AMUSEMENT BUSINESS

★

WE CAN PROVE OUR STORY IN 10 MINUTES.

Operators of Major Park Concessions

Berlo is now operating all food concessions at the mammoth Cleveland Stadium—added proof of Berlo's greater effectiveness.

A·B·C

BERLO VENDING CO.

A·B·C

333 S. BROAD STREET, PHILADELPHIA 7, PA.

INDEXES

1954-55

Complete Subject Index to the 1954-55 Edition

The Entire Editorial Material is Indexed and Cross-Indexed for Easy Reference Use

A

ADVERTISING
Outdoor screen ... 138

AIR CONDITIONING
Basic equipment for ... 336
Central station ... 327
Electronic ... 339
Equipment, location of ... 337
Importance of ... 324
Operating economy of ... 323
Packaged system ... 325
Selection factors ... 324
—in theatre ... 335
Theatre example of ... 338
Vital luxury ... 322

AUDITORIUM
Surround speakers for ... 229

B

BOXOFFICE
Coin changer ... 359
Coin counter ... 359
Sponge rubber pad ... 359
Turnstile admission system ... 162

C

CARPET
Recoloring of ... 192

CONFECTION STANDS
Beverages at ... 384
Concession merchandising ... 389
Concessionaires, operation by ... 393
Display at ... 392
Self-operation of ... 393
Stocking of ... 391
Supervision at ... 390

CONSTRUCTION
Automatic door operators ... 164
Cinema, Swift Current, Sask., Canada ... 32
Clay tile, installation ... 172
Clay tile, maintenance ... 172
Clay tile, uses of ... 170
Fire retardant ... 341
Floor tiles ... 171
Japan, theatres in ... 20
Lighting indoor and outdoor theatres ... 154
Osaka, theatres in ... 31
Plastic wall tile, installation of ... 202
Plywood, types of ... 36
Plywood, use of ... 36
Quick setting cement ... 361
Textured wall covering ... 360
The Centre, Denver, Colo. ... 2
The Hoover, Hong Kong ... 44
Tokyo, theatres in ... 28
Turnstile admissions system ... 162
Wall covering, washable ... 196
Yokohama, theatres in ... 30

CURTAIN CONTROLS
Types of ... 183

D

DECORATION
Carpet, recoloring of ... 192
—of Floor ... 188
—of Lounge ... 187
Plastic wall tile, use of ... 201
Plywood, use of ... 36
Color, use of ... 187
Wall covering, washable ... 196

DESIGN
Cinema, Swift Current, Sask., Canada ... 32
Clay tile, uses of ... 170
Furniture rests ... 344
Japan, theatres in ... 20
Lighting foyer, lobby, lounge ... 157
Lighting indoor and outdoor theatres ... 154
Plastic wall tile, use of ... 201
Plywood, use of ... 36
Textured wall covering ... 360
The Centre, Denver, Colo. ... 2
The Hoover, Hong Kong ... 44
Turnstile admissions system ... 162
Wall covering, washable ... 196

DISPLAY
Black light ... 161
Lighting of ... 156
Wide angle slide projector ... 167

DRIVE-INS
Advertising at ... 138
Black light pest control at ... 134
Chemical fly swatters ... 125
Chemical weed killers for ... 124
Concession building, lighting of ... 160
Electric heaters for ... 122
Emptying the ... 160
Experience with 3-D ... 116
Grading of ... 115
Heaters, experience with ... 123
Heating the ... 122
In-car speaker ... 357
Jewel-tone speaker ... 358
Lighting of ... 159
Magnetic road sweeper ... 357
Painting the ... 120
Panama's first ... 114
Playgrounds at ... 136
Plywood screens for ... 39
Prevent cesspool clogging at ... 357
Rainmaster speakers ... 358
Reflectorized signs at ... 358
Site location of ... 114
Stray light at ... 278
Swimming pools, cost of ... 133
Swimming pools for ... 127
Swimming pools, types of ... 128
Toilet for ... 358
Uniforms for ... 333
VistaVision presentation in ... 237
Wide screen light requirements in ... 239
Wide screens for ... 118

F

FILM
CinemaScope, handling 222
CinemaScope, operation of 231
VistaVision, printing and distribution of 233
VistaVision, squeezed release prints 234
VistaVision, standard release prints 234

FIRE
Common causes 42
Detection of 343
Theatre protection 341
What is 341

FIRE EXTINGUISHERS
Types of 343

FLOORS
Furniture rests can save 344

FRONTS
Automatic door operators 164
Clay tile, uses of 170
Lighting of 156

H

HEATING
Automatic controls for 331
Principle function of 330
Theatre systems 329

HISTORY
Society of Motion Picture and Television Engineers of IX

L

LAMPS, CARBON ARC
Ashcraft Super Power 257
National Excelite 291
Peerless Hy Candescent 259
Peerless Magnarc 260
RCA Wide-Arc System 256
Review of 256
Strong Super "135" 262

LENSES, PROJECTION
Variable anamorphic 356
Vari-Focus 356

LIGHTING
Auditorium and stage 158
Black light 161
Color combination in 155
Indoor and outdoor theatres 154
Projector lamps 155
Reflector lamps 154

LOBBIES
Plastic wall tile, use of 201
Sand urns 359

LOUNGES
Decoration of 187
Interesting examples of 189

M

MAINTENANCE
Dust pick-up attachment 361
Fire retardant paints 41
Flashlight 361
Furniture rests, use of 344
Ice-snow remover 359
—of air conditioning equipment 355
—of clay tile 172
—of uniforms 333
Quick setting cement 361
Sand urns 359
Sound service 285
Tiny tractor 358
Toilet cleaner 361
Utility cabinets 361

MANAGEMENT
Automatic slide changers 167
Coin changer 359
Coin counter 359
Electronic barker 359
Employee training 342
Flashlight 361
Furniture rests, use of 344
Ice-snow remover 359
Intercom system 360
Japan, theatre attendance 20
Reflectorized signs 358
Sand urns 359
Sound service 285
Sponge rubber pad 359
Staff uniforms 332
Textured wall covering 360
Theatre fire protection 341
Theatre television networks 345
Turnstile admissions system 162
Utility cabinet 361

P

PAINTS
Fire retardant 41

PICTORIAL SURVEYS, DRIVE-IN
ABC, Oxon, Md. 80
Broken Bow, Broken Bow, Nebr. 94
Centennial, Littleton, Colo. 108
Claco, Liberty, Mo. 84
Druid Hill, Maryville, Tenn. 110
Family Dri-Vin, Tigard, Ore. 100
Hillside, Hilside, Md. 102
Motor-Vu, Dallas, Ore. 92
New Moon, Lake Charles, La. 76
North Andrews, Ft. Lauderdale, Fla. 90
Reda, London, Ky. 107
Starlite, Lansing, Mich. 104
Sundown, Whittier, Calif. 83
Sundown, Mandon, N. D. 112
Wadsworth, Denver, Colo. 87
Westbury, Westbury, L. I. 98

PICTORIAL SURVEYS, NEW AND REMODELED, ROOFED
Carib, Clearwater, Fla. 49
Carson, Carson City, Nev. 60
Century, Flushing, L. I. 75
Chicago, Chicago, Ill. 68
Cinderella, Detroit, Mich. 70
Cine Tropical, Acapulco, Mexico 56
Film Centre, Baltimore, Md. 59
Fitchburg, Fitchburg, Mass. 63
Fox, Sidney, Nebr. 72
Majestic, Hebron, Nebr. 52
Montrose, Montreal, Quebec, Canada 49
Plaza, Vernon, Tex. 64
State, Raleigh, N. C. 66

PROJECTION
CinemaScope aperture 222
CinemaScope, equipment for 222
CinemaScope film operation 231
CinemaScope, installation of 220
CinemaScope-VistaVision, comparisons of 238
Lenses, variable prismatic expander 236
Pola-Lite 3-D system 283
Single strip 3-D 281
3-D aid 357
Vectograph 3-D system 281
VistaVision, booth operation of 237
VistaVision, definition of 232

VistaVision, lenses for 235
VistaVision process 232
VistaVision, theatre presentation of 234

PROJECTION LIGHTING
Carbon cooler 356
Carbon manufacture 289
Carbons for new systems 253
Carbons for wide screens 254

PROJECTION ROOMS
Rewind device 356

R

RECTIFIER
Selenium 273, 357

REMODELING
Automatic door operators 164
Clay tile, uses of 170
Floor tiles 171
Plastic wall tile, use of 201
Quick setting cement 361
Textured wall covering 360
Wall covering, washable 196
Wall tiles 171

RESTROOMS
Electric hand dryer 360
Plastic wall tile, use of 201
Soap dispenser 360
Toilet cleaner 361

S

SCREENS
Astrolite reflection theory 267
Brightness, importance of 276
CinemaScope, hanging of 226
CinemaScope, types of 225
Curved 180
Effects of stray light on 275
—for CinemaScope 225
—for VistaVision 234
Masking of 183
Wide screen light requirements 238
Widths of 240

SEATS
Sizes of 25

SERVICES
Sound 285

SOUND
CinemaScope, loudspeaker systems for 228
—for CinemaScope 228
—for VistaVision 237
Perspecta sound, installation of 242
Perspecta stereophonic 241
Service methods 285
Stereophonic, application basic principles of 246
Stereophonic, basic principles of 241
Stereophonic, definitions of 241
Stereophonic,reproduction of 243
Surround speakers 229
VistaVision, recording of 233

STAGES
Backgrounds 169
Contour curtain 186
Curtain control 360
Frames, flying of 194
Straight tracks 182
Wide screen curtains, support and control of 180
Wide screen frames 194

SUPPLY DEALERS
—of the Dominion of Canada 372
—of the Rest of the World 373
—of the United States 363

T

TELEVISION
Japan, in 21
Networks for 345
Operating centers 347

U

UNIFORMS
Discussion of 332
Exploitable 333
Maintenance of 333
Men's 332
Women's 332

W

WORLD THEATRES
Survey of 6

Cumulative Index to All Previous Editions

Topical References to All Articles Published in Prior Volumes of Theatre Catalog

SPECIAL NOTE

All entries are given by edition number and, following the colon, the page on which starts the article containing the indicated information.

The dates of the several editions are as follows:

2nd Edition	1941
3rd Edition	1942
4th Edition	1945
5th Edition	1946-47
6th Edition	1947-48
7th Edition	1948-49
8th Edition	1949-50
9th Edition	1950-51
10th Edition	1952
11th Edition	1953-54

A

ACOUSTICS
Absorption of sound 6:145
Absorption coefficients of 9: 14
—in construction 11:XIV
Audibility and 6:244
Behavior of materials 9: 12
Construction of 6:144
Decorative aspects of 2:154
Description of materials 9: 12
Design for 6:144
Effect of painting on 5:224; 9:402
Fabric uses in 4:209; 6:145
Fiberglas and 5:232; 6:160; 9:120
Materials for 6:250
Noise elimination and 6:245
Noise level and 6:244
Paintability of materials 9: 15
Planning of 3:192
Principles of 4:152; 6:244, 249
Remodeling objectives for 10:XXIII
Reverberation and 6:247, 249; 9: 12
Sound distribution in 6:246
Sound transmission and 6:244
Space and 7:324
Studio design and 5:539
Theatre requirements of 2:246

ADVERTISING
Baloon-kite unit in 9:361
Basic appeals in 2:297
Drive-In Methods in 8:303
Exploitation through 2:292; 3:287; 7:494
Forms for record on 6:502
Hints on preparing 6:487; 8:303
Intra-theatre displays and 4:430
Introducing a New Theatre 7:490
Introducing a Drive-In 8:303

Layouts for 3:287
Outdoor stands and 4:440; 8:303
Outside displays and 4:435
"Selling" Your Theatre 7:494
Sign Letter Typography 2:176
Trailers and 5:442

AIR CONDITIONING
Air Duct maintenance for 9:353
Automatic controls in 5:378
Belt maintenance in 9:353
Capacity requirements of 8:430
Centralized systems for 6:390
Comfort and 5:368; 6:403
Compressors, freon 6:399; 9:356
Condenser maintenance in 9:356
Corrosion control in 5:382; 9:351
Dampers in 8:430
Diffusers 7:444; 9:363
Distribution Problems 7:438
Draft control in 4:372
Dry-bulb temperatures, U.S.A. 6:396
Electronic air filters in 3:325; 6:404
Evaporative cooling 9:349
Evaporative condensers for 8:430
Fan care in 9:353
Filters in 9:356
Freon for 6:398; 7:442
Heat pumps in 5:372; 6:416
Heating in relation to 8:430
Humidity control in 6:401
Maintenance of..2:238; 3:319, 331; 4:379; 5:389; 9:353
Medical angles of 2:316
National theatre survey on 8:484
Operational standards in 2:317; 8:430
Ozone-producing Bulb 9:366
Packaged systems 6:390, 395
Plan and design of 2:317
Practical observations on 8:430
Refrigeration in 6:398
Remodeling and 7:165
Reverse-cycle units in 5:372
Solar heating and 6:411, 412
Sterilization with Glycol 7:436
Thermal insulation for 5:386, 387
Types of systems in 2:330; 8:430
Unit systems 6:390, 395; 10:289
Well water system 8:430
Wet-bulb temperatures, U.S.A. 6:396

AIR STERILIZATION
Duct use of lamps in 4:495
Fixtured use of lamps in 4:491; 5:496
Glycol Vapor in 7:436
Technical details of 4:486; 5:496

AISLES
Construction of 6:144
Light Wiring 7: 49

ALARMS, EXIT DOORS
Design and construction 6:141

APPRAISAL
Factors affecting theatre realty 11: 6
Factors in modern 8:492
Market valuations in 10: 19
New influences effecting 10: 19

ARCHITECTS
1949-50 Index to 8:153
Works of John and Drew Eberson 7: 1
Works of S. Charles Lee 8: 1

ASBESTOS CURTAIN
Size and construction of 9: 94

AUDITORIUM
Lighting of 11:VII
Moisture-resistant walls 11:274
Remodeling and construction of the 10:XIX
Seating comfort 11:169

B

BILLIARDS
Installation 6:522
Lounge—refreshment area 6:522
Theatre tie-ins with 6:520
Typical theatre layouts 6:520, 521

BLACK LIGHT
Decorative uses of 4:216; 5:220; 7:316
Theatre uses of 3:12; 9: 4

BOOKKEEPING
Cost Analysis 7:500
Depreciation Schedules 7:503
Management systems 2:286; 3:267; 4:446

BOOTHS, PROJECTION (See PROJECTION ROOMS)

BOOTHS, TICKET (See BOXOFFICES)

BOWLING ALLIES
Attendance potentials of 9:434
— operation in Theatres 9:434
Space requirements for 9:436
Typical installations of 9:437

BOX OFFICES
Aluminum uses in 6:163
Cashier device 11:277
Coin changer 11:277
Comfort and Safety 7: 62
Design of 5:191
Drive-In boxoffices (See DRIVE-IN)
Location of 2:182
Remodeling and construction of the 10:XIV
Staff supervision 11:313
Ticket issuing unit 11:276

BULBS, LAMPS (See LAMPS, INCANDESCENT)

C

CANDY STANDS (See CONFECTION STANDS)

CARBON-ARC (See LAMPS, CARBON-ARC)

CARPETS
Axminster 6:265
Backing and quality 6:264
Burns repair in 6:266
Chenille 6:276
Cleaner, low cost 9:363
Cleaning factors 11:166
Cleaning of 11:160
Cleaning of, on floors 11:162
Color coordination in 6:261
Construction analysis of 9:285
Cushions for (See Carpet Cushions)
Daily care for 6:267
Decorative use of 3:165
Depressions 6:144
Installation of 3:173; 9:115, 287; 10:XXI
Maintenance of ...2:140; 3:296; 4:224; 6:263, 265, 266
National theatre survey on 8:484
Selection, guide to 11:164
Spot removal 6:266; 9:363
Stairway layout 9:287; 10:XVI
Tapestry 6:265
Trends in design and use of 4:221
Velvet 6:266
Wearing recommendations 9:285
Wilton 6:263

CARPET CUSHIONS
All-hair underlinings 9:286
General discussion of 3:169
Sponge rubber 9:286
Yardage figuring for 9:288

CASES, DISPLAY
Design of 5:191

CASH CONTROL
Boxoffice safes 5:460
Counterfeit Bill detector 9:366
Drive-in 7:227
Protection Agency in 9:415
Safes 5:458
Systems for 3:272; 9:365
Theft protection suggestions 9:414
Tickets 3:272
Ticket manipulation in 9:414
Tube transportation 6:432

CENTERS, AMUSEMENT
5-phase project 6:517
Higher admissions in 8: 48

CENTERS, COMMUNITY
Navy Point, Florida 5:174

CENTERS, RADIO
Radiocentro, Havana 8: 11

CENTERS, SHOPPING
Entering an era of 8: 50

CHECK ROOM
Comfort and Safety 7: 63

CODES, BUILDING (See CONSTRUCTION)

COMFORT
Essentials of 2:169; 5:368
Humidity and 6:401
Safety of the Audience 7: 61

CONFECTION VENDING
Attendant's uniform for 8:506
Barbecue, canned, in 10:287
Beverage Bars 6:551; 8:487; 10:286
Beverage bottle service 6:522, 548
Beverage dispensers 11:271
Coin changer 11:277
Concession stand, cleanliness of 11:358
Butter dispensers in 10:288
Cafeteria systems in drive-ins 9:226
Candy in 2:270; 6:518
Candy-counter operations in 2:277
Circuit Operation 7:519
Coffee maker, automatic, in 10:287
Coin counter, wrapper, in 10:290
Cup vending 6:546, 549, 550
Displays for 10:336, 287
Dual-flavor units 6:546
Earnings, how to get 8:502
Equipment costs in drive-ins 9:227
Frankfurter vending 11:273
Front selling at 8:504
Frozen food in 4:526
Hand Book on 10:336
Ice cream in theatres 6:518
Inventory Forms 7:521
Location of 8:503
Lunch vending 11:273
Maintenance of equipment in 4:522; 10:336
Management of 10:336
Merchandise handled by 8:488
Miami Theatre layout 6:519
National theatre survey of 8:486
Payroll in drive-in 9:223
Popcorn in 2:70; 4:522; 6:536; 8:487
Popcorn seasoning 5:515
Sales prices at 8:483
Sanitation codes 5:514
Signs, concession attraction, in 10:287
Sources of supply 8:488
Station systems in drive-ins 9:223
Straw-slot cup lid in 10:287
Study of 11:342
Theatre Problems in 7:516; 8:502
Types and locations 8:486
Vending machines in 2:270
Warehousing for 10:336

CONSTRUCTION
Acoustical 6:144; 9:121
Aisles 6:144
Aluminum in 6:166; 8:175
Attic 6:155
Auditorium 6:139
Auditorium lighting 11:XVII
Awards for "Perfect 36" in 3: 9
Boiler Room 6:154
Bowling Alley 9:434
Boxoffice 6:133
Building codes and ordinances on ... 2:21; 6:16; 8: 56
Building standards in 2: 17
Ceiling 6:140
Cement and concrete in 4:154; 9:106
Convertible theatre 11: 9
Copper used in 4:140
Costs of, current 10: 19
Doors 6:136
Drive-Ins (See DRIVE-IN THEATRES)
Drying of paint and plaster in 8:107
Drying of walls and floors 9:117
Dual-auditorium theatres 3: 17
Economic fundamentals of 4: 8
Economies possible in 3:141
Electric control room 6:154
Entrances 6:130, 134
Escalators in 8:363

Film exchanges 6:156
Flex-Sheet Mirror, use of 11: 57
Fluorescent lamp, dimming control of 11: 64
Formica applications in 10:135
Fronts 4:179
General factors in 6:129
Glass in 7:282; 10:130
"Home in a theatre" 4:461
Ladies rooms 6:150
Lamella timber roof 9: 89
Lead used in 4:141
Lobby 6:136
Marble selection for 8:178
Magnesium used in 4:144
Manager's office 6:154
Men's rooms 6:151
Metal-faced masonry 11: 14
Metals used in 4:131; 10:126
Mexico 4:168
Mezzanine 6:147
Minimum requirements of 8:490
Mirrors, flexible sheet 9:362; 10:289
1952-53 review of new and remodeled 11: 16
Paint, plaster finish in 10:291
Parking, push button 11:329
Perma-Stone, uses in 10:139
Plastics used in 4:152; 10:288
Porcelain enamel used in 4:174
Pre-fabricated building panels 11:277
Pre-fabrication and 4:122, 128
_____, all-steel, and 4:118; 7: 50
_____, alumidrome 6:166; 8:175
_____, drive-in 9:174
_____, plastic-plywood, and 4:125; 7:137
Progressive execution of 3:298
Projection room 6:149; 11:250
Proscenium opening 6:148
Quonsets and 5:145; 6:19, 22, 24, 29; 7:50, 185
Review of 5: 33; 11:XII
Roof gardens 4:460
Seating and sight lines 11:XVIII
Sight lines and 3:153
16mm. developments 11:366
Swank Indian Preview Theatre 11: 11
Small theatre location 11:XIV
Speed drying to rush 8:187
Standee foyer 6:137
Thermal insulation 9:121
Vermiculite and 5:169
Wall covering, washable 11: 61
Waterproofing in 9:117
Wood utilization in 4: 4; 7:137

CORROSION

Control of 5:382

COST ANALYSIS

Budget Fundamentals 7:500

CROWD CONTROL

Handling of crowds 5:502; 9:238, 258

CURTAIN CONTROL

Wiring 7: 49

CURTAINS, ASBESTOS (See ASBESTOS)

D

DECORATION

Acoustic materials in 2:154; 9:402
Acrylic plastics in 6:253
Black light and 3:12; 4:216; 5:220; 7:316; 9: 4
Carpets used in 3:165; 9: 9
Carpet styles 11:164
Cement and concrete in 4:154
Chemists' developments in 4:150
Circlarc Lamps in 6:310
Color and 2:122; 3:188; 4:109; 9: 3
Color concepts of 11: 2
Color groupings in 9: 11
Construction and 6:145
Copper used in 4:140
Design and Color 7:319
Dimmers in 7:330
Drying speed of 8:187
Fabrics used in 2:131; 4:209
Fiberglas used in 5:232; 6:161
Flex-Sheet Mirror, use of 11: 57
Floor coverings in 9: 9
Formica applications in 10:135
Glamour and 4:208
Glass in 7:282; 9:3; 10:130
Lead used in 4:141
Light, color modeling 9: 3
Materials for 9: 9
Metal-faced masonry 11: 14
Metals used in 4:131; 10:210
Mirror, non-glass, in 10:289
Painting with light 6:253
Paint, varnish and lacquer review 9:391
Paint, plaster finish in 10:291
Perma-Stone, uses in 10:139
Plastics used in 4:152; 10:288
Plastic Wall Paneling in 7:299
Plexiglas used in 4:147; 6:253
Rest room 9: 6
Size illusions with 9: 5
Spray painting useage in 9:401
Study of 11:XII
Wall covering, washable 11: 61

DEPRECIATION

Drive-In theatre 8:288; 9:135
Equipment rates 2:265; 7:503

DESIGN

Acoustics and 2:152; 3:192; 6:144
Adaptation of, to locale 2:10; 4: 2
Air conditioning plan 2:317
Aisles 6:144
Alumidrome 6:166; 8:175
All-negro theatre 9:102
Architects, 1949-50 index to 8:153
Art-cinemas 6:509
Attic 6:155
Auditorium 6:139; 8:354
Auditorium lighting 11:XVII
Black light in 9: 4
Boiler room 6:154
Bowling alley 9:434
Boxoffice 5:191; 6:133
Boxoffice location 2:181
Candy stands 5:510
Capacity computation in 6:129
Carpet trends in 4:221
Ceiling 6:140
Centers, amusement 6:517; 8: 48
Centers, community 5:174
Centers, radio 5: 11
Centers, shopping 8: 50
CinemaScope wide screen 11:205
Cinerama, a new process in 9:321
Cinerama, installation of 11:192
Color and 4:109; 9: 3
Color concepts of 11: 2
Comfort and Safety Rules 7: 61
Computation of capacity in 6:129
Convertible theatre 11: 9
Crowd control 9:258
Display cases and 5:191
Drive-Ins (See DRIVE-IN THEATRES)
Dual auditorium 3: 17
Entrances 6:130
Escalators for balconies 8:363
Film exchanges 6:156
Flex-Sheet Mirror, use of 11: 57
Fluorescent lamp, dimming control of 11: 64
Formica applications in 10:135
Fronts 3:199; 4:179
Functionalism in 2:22; 6: 6
Future aspects of 2:12; 6:7; 8: 47
Glass in 10:130
"Home in a theatre" 4:461
Hospital theatre 9: 99
Index to Theatre Designers 8:153
Interesting Canadian Theatre 7: 34
Interesting Latin-Amer. Theatre 7: 43
Ladies' rooms 6:150
Lamella roof 9: 89
Lighting, interior 4:218; 9: 3
Lobby 6:136
Low Overhead "Run" Theatres 10:117
Maintenance angles in 2: 20
Manager's office 6:154
Marble uses in 8:178
Men's rooms 6:151
Metals, Rigidized, in 10:210
Merit awards for 9: 16
Mexican theatres 4:168
Mezzanine 6:147
Mirror, non-glass, in 10:289
Never-Swept Theatre 7: 47
1952-53 review of new and remodeled theatres.. 11: 16
Parking, push button 11:329
Perma-Stone, uses in 10:139
Plumbing 9:283
Pre-fabrication and 4:4, 118, 125; 6:166; 7:50, 137; 8:175
Problems in 5: 2
Projection room ... 2:202; 3:260; 4:326; 6:149; 11:250
Proscenium opening 6:148
Remodeling plan in 10:IX, 126
Requirements for future 8: 47
Revolution in 11: 7
Roof gardens in 4:460
Seating 4:226; 8:354
Seating, acoustics of 11:XVI
Seating and sight lines 11:XVIII
Seating, comfort of 11:169
Signs and letters, use of 11:138
16mm. theatre 11:366
Swank Indian Preview Theatre 11: 11
Theatre realty, factors affecting 11: 6
Shopping centers, regional, in 10: 24
Sight lines in 3:153; 8:354
Signs 2:194
Size illusion through 9: 5
Small town theatre, A 10:121
Solar heat with glass 10:134
Stadium plan 6:146
Stages 4:229; 5:237; 9: 94
Standee foyer 6:137
Studio acoustic 5:539
Suburban shopping influences on 10: 24
Theatres in airplanes 5:554
Theatres in ships 5:471
Theatres in trains 5:471
3-D, explanations of 11:210
Tile in 9: 10
Toilet plan 4:278; 10:222
Trackless Bandcar on Stage 10:226
Trans-Lux advantages 4:468
Turnstiles, use of, in 10:119
United Nations buildings, New York 11:XXXII
Visual comfort 8:354
Window blind, vertical, in 10:290
Wall coverings, washable 11: 61
Wide screen, explanation of 11:210
Wide screen frame 11:276
Wide screens 11:197
World theatres, Survey of 10: 2

DISPLAYS

Aluminum used in 6:163
Cases and frame design..5:191; 6:134, 136; 10:XV, 288
Black light 11:273
Intra-theatre advertising 4:430
Oversize advertising 4:435

DRIVE-IN THEATRES

Admission Tax Rulings 8:292
Advertising Stunts 8:302, 303; 9:417
Aluminum in construction of 10:193
Audience potential for 8:196; 9:128
Background Data on 7:221
Better construction of 8:233
Blacktop methods 8:316
Boxoffice needs in 6:186; 7:258
Building during metal shortage 10:150
Cafeteria systems for 9:226
Cash Control in 7:227
Cleaning 11:272
Chairs for 9:361
Concession business, cleanliness 11:358
Concession business, study of 11:353
Cleaning equipment for 9:242
Concerts, Afternoon, in 10:200
Concession stands .. 6:187; 7:257; 8:312; 9:226; 10:287
Confection sales intercom 8:294
Confection vending equipment for .. 9:243; 10:286, 287
Confection payrolls in 9:228
Daylight showings in 8:297
Depreciation for tax 8:288; 9:135
Design and construction 3:145; 4:471; 6:180; 7:255 8:201, 237
Display, all metal 9:360
Drainage in 6:183
Drive-Over and Drop-In 4:105
Equipment needs in 6:189; 9:227, 242
Electrical Installation for 7:258
Entertainment preferences in 8:199
Fence needs in 6:189
Fencing with Billboards 7:236
Filter beds for 9:172

Four screen plan for 9:178
Fire protection 11:272
Fly-in drive-in 9:221
Grading Problems 7:256; 8:315
Heaters for 9:360
Home In a 7:222
Hy-Arc projection lamp 11:276
Ideal layout for 6:180; 8:237
Incinerator for 10:287
Indoor drive-in plan 10:146
Insect Control in 7:237
Insect screens for 9:361
Insecticides for Use In 7:238
Insurance requirements for 8:290; 9:240
Intercom Confection Sales 8:294
Junction boxes, waterproof, for 10:286
Landscape needs for 6:188; 8:275
Lawn areas, care of 11: 74
Layout Planning 8:237
Legal Decisions re. 8:242
Legal Position of Patents 8:165
Lighting Ramp Areas 7:259; 10:286
Lighting drive ways in 9:362
Maintenance Procedures for 8:283
Management methods 4:471; 5:470; 8:248, 310; 10:156
Man-made Moonlight 7:259
Metal-faced masonry in 11:245
Metal projector reflectors 11:245
Mobile outdoor circuit 9:181
Monkey villages in 8:300
New Designs of 1949-50 ..... 8:201
Newspaper ads for 11:331
1953 Season list of 11: 86
Nurserymen of the U. S. 8:276
Oil dressing methods 8:316
Operating procedures 2:15; 8:248, 310
Ordinances covering 6:182; 8:242
Pagoda seating in 9:361
Patents, design 8:165
Patrons, who are the 8:196 9:132
Perma-Stone, uses in 10:138
Personnel safety precautions 11:327
Pest control 11:272
Pictorial Survey, New 11: 41
Plants suitable for 8:275
Playground areas in 9:233; 10:286; 11: 78
Portable operation 9:181
Power plant units for 9:181
Prefab, Martin plan for 9:174
Projection buildings 6:187; 7:257
Rain visor for 9:361
Reopening procedures 9:417
Sanitation equipment for 9:242
Screen maintenance 9:420
Screen Tower, Another Home in A 11: 84
Screen towers
6:185; 7:242, 257, 265; 8:297; 10:151; 11: 82
Seasonal Closing Rules 7:231; 9:417
Segregation Problem in 8:236
Septic tank plan and maintenance 9:169
Shopping center, Part of 10:146
Showmanship in 8:233; 10:200
Sign needs of 6:185
Site Selection 7:255; 8:237
Size calculation 8:237
Smaller community theatres 8:235
Speaker Design 7:243
Speaker posts, Wooden, in 10:151
Speakers, weather-resistant 11:273
Staff supervision 11:318
Staff uniforms 11:272
Station vending in 9:223
Supplies for 9:242
Surfacing of 6:184; 8:315
Survey of Audience potential 8:196
Survey of Structure and Practice 8:248
Swimming pools for 9:360
Tax Rulings 8:292
Television in 11: 70
Test Borings for 7:257
Theatres of Today and Tomorrow 8:233
Tips on good management 8:310
Toilet room equipment for 9:242
Toll Systems for 7:263
Topographical Plans for 7:251; 8:237
Traffic control, automatic 9:238
Trailer copy for 10:326
Traffic signals, portable 9:360
U. S. Theatres during 1949 ..... 7:198
U. S. Theatres during 1950 ..... 8:253
U. S. Theatres during 1951 ..... 9:137
U. S. Theatres during 1952 ..... 10:161
Underground Cables for 7:249
Water cooler in 9:282
Water systems for 9:361
Weed Control in 8:313
Zoning regulations 8:242

E

ELECTRIC
Notes on Wiring 7: 48

EMERGENCY
Exit Doors 6:141
Fire 4:232, 505, 540
First Aid 4:509
Holdup safeguards 5:461
Lighting 5:482
Portable power for drive-ins 9:181
Power Equipment 7:337

EQUIPMENT
Check List of 7:168
Chemists' developments in 4:150
Conservation of 3:278a
Costs of, current 10: 21
Depreciation rates of 2:265; 7:503
Maintenance of 3:278a; 4:379
Minimum recommendations 8:491
Projection 3:243, 260
Remodeling and 7:167
Sound 4:313
Television 5:534; 8:512
Toilet 4:278

EXHIBITION
Children's shows in 5:476
Cost Analysis 7:500
Depreciation Schedules 7:503
Itinerant booths in 4:129

EXITS
Remodeling and construction of 10:XXIX

EXPLOITATION
Advertising and 2:292; 3:287; 8:303
Construction 6:478
Hearing aids in 6:349
House organs and 6:486
Local news reels 5:564, 568
Posters in 4:433; 8:303
Trailers in 2:292; 5:442

F

FABRICS
Acoustic effect of 4:209; 6:145
Construction with 6:146
Decoration and 2:131; 4:209
Fiberglas 4:112; 5:232; 6:160
Pile, analysis of 9:276
Plastic, quilted 10:288
Progress in 4:211
Theatre individuality and 2:211
Upholstering and 3:149; 9:276

FILM
Print damage, causes of 10:256
Safety and nitrate identification 10:255
Splicing methods for 10:266
Theatre TV uses 10:364
3-D, SMPTE and MPRC Report of 11:230

FINANCING
RFC procedures in 2: 13

FIRE
Duties of personnel in 4:540
Fighting of 4:232
Sprinkler protection 6:429
Tragedy prevention in 4:505
Types of 4:232

FIRE EXTINGUISHERS
Locations for 3:276; 4:232; 5:483
Maintenance of 3:276; 4:232; 5:483
Types of hand-operated 4:232; 5:483

FIRST AID
Refresher course on 4.509

FLOORS, HARD-SURFACE
Asphalt tile 6:208
Asphalt tile, how to protect 11:154
Carpet cleaning 11:160
Concrete 9:106
Concrete, how to protect 11:155
Covering the 9:114
Linoleum, how to protect 11:158
Decorative finishes for 9:113
Maintenance of 4:134; 9:115
Remodeling and construction of 10:XX
Rubber tile, how to protect 11:157
Terrazzo, how to protect 11:156
Wood, how to protect 11:157

FLOOR SLOPES
Curves 6:143
Elevation 6:142
Sightlines and seating 2:118; 3:153; 6:140

FRONTS
Aluminum used in 6:163; 8:175
Automatic door 11:273
Baloon-kite advertising on 9:361
Black light 11:273
Design of 3:199; 4:179; 6: 8
Doors, safety 11:273
Floodlighting for 9:256; 10:288
Glass used in 2:178
Metals, rigidized, use in 10:210
Plastics used in 2:178
Porcelain enamel in 2:178; 4:174
Remodeling of 6:206; 8:339; 10:XII
Screen tower entrances, drive-in 10:153
Sidewalk housekeeping 11:143
Signs and letters, use of 11:138

G

GENERATORS
Brush care 7:472
Discussion of 4:288

GLASS
Edge lighting of 9: 3
Theatre fronts 2:178

H

HAND DRIERS
Acceptance of 8:446
For lavatories 5:282; 8:446

HEARING AIDS
Developments in 8:473
Induction system 6:349
Potential revenue from 6:347

HEATING
Drive-in methods 9:360
Gas Turbine method of 6:414
Maintenance of 5:392; 8:430
Powder-fine coal system 6:414
Practical observations on 8:430
Radiant heat discussion 4:375
Remodeling and 7:164; 10:XXX
Solar principle in 6:411, 412
Summer care of 5:292

HEAT PUMPS
Air conditioning with 5:372

HOLDUPS
Safeguards against 8:461

I

INSECTICIDES
Drive-in 7:238
Kinds and uses of 4:498
Pest control 9:425

INSULATION, SOUND
Fiberglas in 4:112
Vermiculite for 6:171

INSULATION, THERMAL
Air conditioning and 5:386
Mineral wool in 6:168
Roof treatment for 5:387
Types of 6:168

INSURANCE
Drive-Ins ... 8:290; 9:240
Types of coverage by ... 4:444

INVENTORY CONTROL
Forms for ... 6:492
Item identification in ... 6:491
Repair shop reports in ... 6:492
Warehouse reports in ... 6:492

L

LAMPS, CARBON-ARC
Air-cooled arc tests ... 8:392
Arc stabilization method in ... 6:339
Ashcraft C-70 ... 6:338
Carbon burner, continuous for ... 9:362
Carbon Cooling effects ... 8:401
Electronic-control ... 5:286; 7:400
Gaumont-Kalee 21 ... 6:332
High-intensity Lamp ... 7:393
High-intensity Light in ... 7:390
Low-intensity types of ... 3:247
Motiograph-Hall ... 7:398
Operation of ... 2:223
Performance, optimum of ... 8:392
Requirements for ... 3:219; 4:285
Terminology for ... 3:231
Water-cooled arc tests ... 8:392

LAMPS, CIRCLARC
D.C. operation ... 6:311
Wiring diagram ... 6:310

LAMPS, CONCENTRATED-ARC
Description of ... 5:289

LAMPS, INCANDESCENT
Bulb maintenance ... 5:187
Storage ... 6:154

LAMPS, STERILIZATION
Duct use of air ... 4:495
Fixtured use of air ... 4:491; 5:496
Ultraviolet sanitation ... 4:486, 491, 495; 5:496

LAVATORIES
Comfort and Safety ... 7: 64
Hand driers in ... 5:282; 8:446
Plastic Wall Paneling ... 7:299
Sanitation Practices ... 7:506
Sanitation Service ... 7:509

LAWSUITS
Drive-In ... 8:242
Suggestions for avoiding ... 2:297

LENS COATING
Developments and history of ... 4:299

LENSES, PROJECTION
Low-reflection films for ... 4:299
Orthoscope auxiliary system for ... 4:293
Screen results with ... 2:241

LIGHTING, EMERGENCY
Discussion of ... 5:482

LIGHTING, EXTERIOR
Drive-In ... 9:362
Floodlighting the front ... 9:254; 10:288
Indirect systems for ... 3: 19
Modernization with ... 5:7; 10:XXV
Sign ... 6:131; 10:287, 289
Sign Wiring ... 7: 48

LIGHTING, INTERIOR
Auditorium ... 11:XVII
Black lighting ... 9: 4
Circlarcs in ... 6:310
Dimmer Methods ... 7:330; 10:289
Examples of ... 9: 7
Emergency Equipment ... 7:337
Fluorescent lamp, dimming control ... 11: 64
Indirect systems for ... 3: 19
Modernization with ... 5:7; 10:XXV
Panel Board Wiring ... 7: 48
Planning for ... 4:218
Rest room ... 6:151
Spotlights for ... 9:362
Suggestions ... 7:327

LIGHTING, PROJECTION
(See PROJECTION LIGHTING)

LIGHTING, SIGN
Cold-cathode in ... 5:178

LOBBY
Carpet styles ... 11:161
Carpets, floor-cleaning of ... 11:162
Ceiling construction ... 6:136
Comfort and Safety ... 7: 63
Entrance mat ... 11:274
Floor matting, heavy duty, for ... 10:288
Floors, how to protect ... 11:154
Formica, use in ... 10:135
Glass, use in ... 10:130
Guide ropes ... 11:274
Remodeling and construction of ... 10:XVI, 126
Rubber mat uses ... 4:182

LOBBY FRAMES (See CASES, DISPLAY)

LOUNGE
Comfort and Safety ... 7: 63

M

MAINTENANCE
Air conditioning ... 2:328; 3:319, 331; 4:379; 5:389; 8:430; 9:353
Asphalt tile, how to protect ... 11:154
Carpet cleaning ... 11:160
Carpet guide ... 11:161
Carpets ... 2:140; 3:296; 4:224; 6:263, 265; 9:363
Carpets, floor-cleaning of ... 11:162
Cement water paints ... 9:402
Concrete floor, how to protect ... 11:155
Construction notes on ... 6:132
Dust control formula for ... 9:364
Electric fuse ... 11:277
Emergency power ... 11:277
Equipment ... 3:278a; 4:379
Fire alarm station ... 11:277
Floors, how to protect ... 11:154
Hard surface floors ... 4:184; 9:364
Heating ... 5:392; 8:430
Linoleum, how to protect ... 11:158
Marble ... 8:183
Never-Swept Theatre ... 7: 47
Paint brush ... 9:401
Paint, varnish and lacquer ... 9:391
Plumbing fixture ... 6:320
Pre-fabricated building panels ... 11:277
Procedures in ... 2:290
Projection equipment ... 2:226; 5:323
Rubber mats ... 3:216; 5:194; 9:262
Rubber tile, how to protect ... 11:157
Sand urn ... 9:365
Sanitation Practices ... 7:506; 9:280
Signs ... 4:177; 5:187
Sound ... 2:210; 5:123
Spot removal in ... 9:363
Terrazzo, how to protect ... 11:156
Theatre preservation through ... 5:435
Upholstery ... 9:364
Vacuum systems ... 6:428; 7:346
Wood floors, how to protect ... 11:157

MANAGEMENT
Admission control system ... 9:365
Air refreshener ... 10:291
Appraisal of theatres ... 10: 19
Art-cinemas ... 6:508
Art theatre policy ... 11:309
Audience, recapturing ... 11:309
Bookkeeping system for ... 2:286; 11:316
Burglar and intruder alarms ... 9:366
Cash controls for ... 3:272
Children's shows ... 5:476
CinemaScope wide screen ... 11:205
Cinerama arrives ... 11:192
Clearance calendar for ... 2:284
Coin changer ... 11:277
Drink dispenser, maintenance of ... 10:346
Confection stand ... 8:502; 10:336
Coin counter, wrapper ... 10:290
Concession business, cleanliness ... 11:358
Concession business, study of ... 11:342
Discussion of ... 2:278
Drive-In theatres and ... 4:471; 5:470; 8:248, 310
Eidophor TV system ... 11:362
Film damage, causes of ... 10:254
Fire protection system ... 10:290
Forms and systems for ... 3:267; 4:446
Handling cash ... 11:277
Hearing aids in ... 6:348; 8:473
Insurance program for ... 4:444
Intercom system for ... 10:289
Low Overhead "Run" Theatres ... 10:117
Old films on wide screens ... 11:197
Paging, silent ... 9:366
Parking, push button ... 11:329
Personnel safety precautions ... 11:327
Personnel training in ... 10:322
Pest control in ... 9:425; 10:291
Press relations of ... 11:306
Popcorn and ... 4:522
Programming ... 11:311
Projection room safety ... 11:250
Purchase order system for ... 9:422
Scaffolds, aluminum ... 10:290
Seating, comfort of ... 11:169
Service companies and ... 4:420, 428; 9:415
16mm combination policy ... 6:572
16mm. developments ... 11:366
Small theatre location ... 11:XIV
Snow melting, sidewalks ... 11:143
Staff check-up service ... 10:322
Staff supervision ... 11:318
Stereophonic sound developments ... 11:236
Supply storage and inventory ... 9:423
Tax guide ... 11:312
Television progress ... 10:358
Television threat to real estate ... 11: 7
Theatre real estate values, New York City ... 11: 6
Theft protection ... 9:414
3-D, explanation of ... 11:210
3-D, history of ... 11:216
3-D, SMPTE and MPRC report of ... 11:230
Ticket issuing unit ... 11:276
Trailers in ... 5:442; 10:326
Trans-Lux theatres and ... 4:468
Wholesale buying for ... 2:298
Wide screens, explanation of ... 11:210
Window blind, vertical ... 10:290

MARBLE
Its Selection ... 8:178
Its Maintenance ... 8:183

MARQUEE
Animation thru trailers on the ... 8:330
Design of ... 2:194
Lighting ... 6:131
Poblocki "Inner-Service" ... 7:290
Trailers on the ... 8:330

MATS, RUBBER (See RUBBER MATS)

MODERNIZATION (See REMODELING)

N

NEWSREELS, HOME-MADE
Cooperative plan for ... 5:564
Experiences with ... 5:568

P

PAINTING
Aluminum practices in ... 10:199
Effect on acoustics ... 5:224; 9:15, 402
Paint brush care ... 9:401
Paint, varnish and lacquer review ... 9:391
Remodeling in ... 10:XXIII
Speed-Drying of ... 8:187
Spray usage in ... 9:401

PARKING
Barriers for ... 6:499
Claims checks in ... 6:499
Downtown problems ... 8: 48
800-car lot for ... 5: 30
National theatre survey on ... 8:485
Off-street facilities for ... 5: 14
Space needs of cars ... 6:498
Zoning on ... 6:497

PERSONNEL
Confection attendants uniform ... 8:506
Drive-In rules for ... 8:310

Fire training 4:540
Hand signals for 2:167
Home-study course for 4:536
Manager training 5:529
On-job training course for 4:539
Operator's training course 5:572
Patron expectations of 2: 64
Rules of conduct for 2:262
Sanitation Course 7:506
Standee management by 2:266
Work of managers 5:522

PESTS (INSECT)
(See INSECTICIDES)

PLASTER
Remodeling in 10:XXIII
Speed-Drying of 8:187

PLUMBING
Structural considerations for 9:283

PRINTS, 16-mm.
Prolonging service life of 5:570

PROJECTION
Anamorphic lens 11:205
Arc lamps, continuous operation of 11:248
Arc slide 11:276
Carbon monoxide gas in 6:352
CinemaScope wide screen 11:205
Cinerama arrives 11:192
Cinerama, a new process in 9:321
Cyanide gas in 6:352
Eidophor TV system 11:362
Equipment for 4:304; 9:243
Fault correction in 5:302
Film damage, cause of 10:254
Heat deflector 11:276
Hy-Arc lamp 11:276
Hypergonar process 11:208
Light surrounds for screens 11:XXI, 240
Metal reflectors 11:245
New techniques, explanation of 11:210
Old films on wide screens 11:197
Safety requirements 11:250
Seating and sight lines 11:XVIII
16mm. developments 11:366
Standards for 2:228
Stereophonic sound developments 11:236
Television in drive-ins 11: 70
Theatre TV 10:364
3-D, explanation of 11:210
3-D, history of 11:216
3-D, SMPTE and MPRC report of 11:230
Variascope wide screen 11:XXIII
Wide screens, explanation of 11:210

PROJECTORS, 16-mm.
(See 16mm.)

PROJECTION LIGHTING
Carbons in 5:313
Carbon burner, continuous 9:362
Concentrated arc lamps 5:289
Cooling effects on 8:401
Electronic control lamps 5:286
High-intensity lamps 7:390, 393, 398
Light absorbing devices 9:320
Low-intensity lamps 3:247
Operation of lamps 2:223
Performance of arcs 8:392
Requirements for 4:285
Size and type carbon for 9:318
Terminology for 3:231
Types of lamps used in 9:318

PROJECTION OPTICS (See LENSES, PROJECTION)

PROJECTION ROOMS
Design and plans for ... 2:202; 4:326; 6:149; 10:XXVI
Dual equipped 8:517
Equipment for 3:243, 260
Hazards in 5:328
Itinerant exhibition 4:129
Location of 3:260
Telephone in 6:149
Wiring diagram for 10:XXVII

PROJECTORS
Ballantyne Model R 7:402
DeVry 12000 series 6:329
Gaumont-Kalee 6:332
Maintenance of 2:226; 5:323
Motiograph Model AA 5:293
Portable 35 mm. 7:109
RCA No. 60 ..... 7:405
Service for 4:420
Simplex X-L 8:396
Survey of 4:304

PROJECTORS, 16-mm.
Developments in 5:550
Discussion of 5:550
Dual-equipped screening room 8:517
Trends in 5:550

Q

QUONSET
Construction with 5:145; 6:19, 22, 24, 29, 31; 7:50, 185

R

REAL ESTATE VALUES (See Appraisals)
RECTIFIERS
Copper oxide 4:291; 5:306
Magnesium-copper sulphide 5:308
Selenium 5:309
Tube type 6:341

REFLECTORS
Manufacture of 4:293

REMODELING
Accoustics in 10:XXIII
Air conditioning in 10:XXX
Auditorium 7:161
Auditorium lighting 11:XVII
Balcony 7:163
Building Codes in 7:154
Business-boosting through 2:281
Carpet styles 11:161
Decoration, color concepts of 11: 4
Decoration, review of 11:XII
Design, revolution in 11: 11
Examples of 7:169
Flex-Sheet Mirror, use of 11: 57
Fluorescent lamp, dimming control of 11: 61
Front 7:155
Glass, uses of, in 10:130
Lobby 7:158
Metal-faced masonry 11: 14
Methods in 3:180; 10:IX, 126, 228
Modernizing with light 5: 7
New Theatre, Baltimore 5:129
Obsolescent auditoriums and 4:157
Perma-Stone use in 10:139
Practices in 7:154
Pre-fabricated buildings panels 11:277
Projection room requirements 11:250
Rest Room 7:159; 10:222
Restrooms, wall covering 11:274
Seating and sight lines 11:XVIII
Seating, comfort of 11:169
Signs and letters, use of 11:133
Wall covering, washable 11: 61
Wide screen, explanation of 11:210
Wiring and 7:166

REST ROOMS
Appeal value of 2:124
Formica use in 10:137
Hand dryer 11:275
Metal-faced masonry in 11: 15
Modern recommendations for 10:222
Remodeling and construction of 10:XVIII
Toilet door lock 11:275
Toilet seat, germ-free 11:275
Wall covering for 11:274

ROOFS
Asbestos Coating 7:146
Construction of 4:166
Essentials of Waterproof 7:146
Inspections in Remodeling 7:154
Lamella design 9: 89
Remodeling the 10:X
Thermal insulation 5:387

RUBBER MATS
Application of 9:260
Care and maintenance of 3:216; 5:194
Installation of 3:177; 9:261
Lobby uses of 4:182
Stair treads of 9:364
Types of 9:261

S

SAFES
Discussion of 5:458
Theft protection through 9:414

SAFES, BOX-OFFICE
Discussion of 5:460

SAFETY
Accident prevention of rubber mats 9:260
Comfort and 7: 61
Drive-In equipment for 9:242
Underwriters' film standards 5:489

SANITATION
Codes and, in theatre vending 5:514
Glycol Vapor 7:436
Hand driers and 5:282; 8:466
Practices 7:506
Ultraviolet light and 4:486, 491, 495; 5:496
Vacuum Cleaning in 7:346
Water cooler 9:280

SCREENING ROOM
Dual equipped 8:517
Wiring Notes 7: 49

SCREENS
Caldwell Halo 11:240
CinemaScope wide screen 11:205
Cinerama, installation of 11:192
Drive-In, maintenance 9:420
Eidophor TV system 11:362
Light surround of 11:XXI, 240
Masking methods for 10:228
Old films on wide screens 11:197
Paramount wide screen 11:197
Photorama wide screen 11:203
Projection lenses and 2:261
RCA Synchro 11:243
Raytone Transcenic 11:242
Retiscope (Nu-Screen) 4:234
3-D, explanation of 11:210
3-D, history of 11:216
3-D, SMPTE and MPRC report of 11:230
Universal-International wide screen 11:201
Variascope wide screen 11:XXIII
Wide screen, explanation of 11:210
Wide screen frame 11:276

SEASONING, POPCORN
Discussion of 5:515
Types of 5:515

SEATING
—accoustics of 11:XVI
—and sightlines 11:XVIII
Comfort of 11:169
Correct 7:342; 8:354
Designs for 4:226; 6:142
Drive-In 9:361
Floor Slopes in 7:344
Installation of 3:157; 4:226; 10:XXII
National theatre survey on 8:485
Sightlines and 2:118; 3:153; 7:343
Spacing for 2:118
Stagger Seating 7:343
Upholstery selecting for 9:276

SERVICES
Air-conditioning 5:428
Housekeeping 5:428
Inventory 5:428
Management 5:428
Projection 5:434; 9:419
Sound 5:434; 9:419
Trade-union 5:428
Users of 4:420

SIGNS (AND LETTERS)
Black light 11:273
Cold cathode in 5:178
Design of 2:194; 6:130
Maintenance of 4:177; 5:187
Remodeling and construction of 10:XIII
Review of 5:181
Storage 6:132, 154
Typographic principles for 2:176
Use of 11:132

SITES FOR THEATRES
Desirable Locations 8: 43
Social Habits in Relation to 8: 43

———, in Large Urban Centers 8: 44
———, in Fringe Areas 8: 45
———, in Suburban Neighborhoods 8: 45
———, in Small Towns 8: 46

16-MM.
Business films in 5:559
Carbons, hi-intensity 6:570
Dual-equipped screening room 8:517
Emergency Use of 7:534
Equipment for 4:483
Hospital uses of 6:511
Marcal Theatre, Hollywood 5:546
Operator's training course 5:572
Plastic-plywood construction for 4:125
Potentialities of 4:483
Theatre TV use of 9:446
Vehicles for utilizing 5:554

SOUND
Absorption values 6:145
Action of 6:246
Cinerama, a new process in 9:321
Cinerama, installation of 11:192
Drive-In equipment 9:243
Drive-In opening procedures 9:419
Duosonic loudspeakers 6:337
Fault correction in 5:320
Magnetic recording device 11:275
Maintenance of 2:210; 5:123
Requirements for hearing 6:244
Service on 5:434
16mm. developments 11:366
Stereophonic 11:366
Stereophonic developments 11:236
Survey of equipment for 4:313

STAGES
Asbestos curtain heights 9: 94
Cinerama, installation of 11:192
Curtain control unit for 10:288
Design of 4:229; 5:237; 6:2, 148
Equipment for 4:229; 5:237; 9:94; 10:289
Lighting 6:268
National theatre survey on 8:485
Overhead structure requirements 9: 94
Remodeling and construction of 10:XXVIII, 228
Spotlights for 9:362
Trackless handcar use in 10:226

STANDS, CANDY (See CONFECTION VENDING)

STUDIOS, BROADCAST
Acoustic design of 5:539
Station WBAL, Baltimore 7: 57

SUPPLIES
Proper handling of 9:422

T

TELEPHONES
Intercom Wiring 7: 49

TELEVISION
Analysis of (1950) 8:512
Boxoffice potentials of 8:512; 10:368
British experience in, for theatres 4:552
Eidophor System 11:362
Equipment for 5:534; 6:566; 10:361, 364
Film intermediate (Simplex) 9:416
Home study course for 9:450
—in drive-ins 11:70
Large Screen 7:528
Management considerations in 9:446
Motion-picture Industry and 4:544, 545, 549, 569; 6:566; 8:512
Principles of 4:563
Projection room requirements 11:251
Theatre progress in 10:358
Training program for 9:450

TICKETS
Cash-control system with 3:272

TILE
—in interior design 9: 10
—installation on concrete 9:115

TOILETS
Advancements in 6:307
Designs and planning of 4:278; 9:283
Drainage and sewers for 9:282
Drive-In equipment for 9:242
Equipment for 4:278; 6:318, 319; 10:223
Ventilation for 9:284

TRAILERS
Advertising use of 5:442
Exploitational use of 2:292; 5:442
Marquee use of 8:330
Place of, in management 5:442

TRANS-LUX THEATRES
Equipment for 4:468

U

UNDERWRITERS
Film safety standards 5:489

UPHOLSTERY
Imitation leathers in 9:277
Pile fabrics in 9:276
Shampoo scrubbing of 9:364
Spot removal on 9:363
Wearing qualities of 3:149

V

VACUUM CLEANING
Theatre Methods in 7:346

VENDING MACHINES
Frozen food 4:526

VENTILATION
Draft control in 4:372
—of toilet rooms 9:284
Toilet room 6:152

W

WALL FABRICS
Installation in remodeling 10:XXIV

WALLPAPER
Developments in 5:276
Uses of 5:276

WALLS, MOISTURE-RESISTANT (See AUDITORIUM)

WATER COOLER
Cleaning and sanitation of the 9:280

WATERPROOFING
Compounds for masonry and cement 9:117
Drying walls and floors 9:117
Toilet rooms 6:152

WIRING
Fundamentals for Theatre 7: 48
Remodeling and 7:166; 10:XXI
Requirements for Blacklight 7:317
Set screw connector for 9:365

WORLD THEATRES
England's first post-war theatre 11: 9
Statistics on Number of 8: 38
Survey of 10: 2
Alabama
Hartselle, Ranch 11: 46

Pictorial Surveys

Drive-Ins

Arizona
Tucson, Rodeo 8:222

Arkansas
Pocahontas, Skylark 8:213

California
Inglewood, Century 8:221
Ontario, Valley 7:132
Pico, Whittier 8:206
San Francisco, Geneva 9:206
San Pedro, San Pedro 8:225
Santa Rosa, Village 11: 50
Visalia, Sequoia 9:200
Woodland, Sunset 9:214

Delaware
Wilmington, Brandywine 8:210

Florida
Miami, Tropicaire 8:212
Tallahassee, Drive-In 8:227

Georgia
Augusta, Forest Hills 11: 52
Rome, Cedar Valley 8:208

Illinois
Canton, Hillcrest 9:216
Centralia, Centralia 9:208

Iowa
Des Moines, Capital 11: 44
Dubuque, Dubuque 8:224

Kansas
Wichita, Meadow Lark 10:108

Kentucky
Bowling Green, Lost River 9:212
Carollton, Riverview 9:192
Covington, Dixie Gardens 6:190
Florence, Florence 6:197
Louisville, Twin 9:185
Paducah, Paducah 8:220

Louisiana
Thibodaux, Colonial 9:219

Maine
Waterville, Winslow 8:201

Maryland
Beltsville, Sidney Lust's 6:194

Massachusetts
Springfield, Round Hill 10:112

Michigan
Battle Creek, Battle Creek Auto 7:130
Caro, Caro 9:204
Detroit, Bel-Air 11: 54
Flint, U.S. 23 ..... 10:104
Fraser (Detroit) Gratiot 7:128; 10:156
Niles, Niles Outdoor 7:126

Missouri
Kansas City, Heart 11: 42

Mexico, Little Dixie Airway 9:194

New Jersey
Belmar, Fly-In 9:221
Eatontown, Eatontown 9:202
Pleasantville, Atlantic 9:188
Trenton, Lawrence 8:209

New York
Kingston, 9W 8:219
Rochester, Central 5:120
Syracuse, Kallet 5:122

Ohio
Cincinnati, Twin 8:230
Greenville, Speedway Auto 5:126
Miamisburg, Miami Cruise-In 5:124
Salem, Salem 5:128

Oklahoma
Oklahoma City, Odom 6:196
Woodward, Terrytime 9:210

Oregon
Medford, Starlight 8:216

Pennsylvania
Eddystone, Chester Pike 8:228
Espy, Family 9:220
New Kensington, Family 7:134
Philadelphia, Lincoln 6:192
Reading, Reading 8:202

South Dakota
Pierre, Sioux 11: 56
Memphis, Skyview 8:218

Tennessee
Memphis, Summer 7:136
Nashville, Colonial 9:217

Texas
Beaumont, Pyramid 9:198
Corpus Christie, Gulf 8:205
Dallas, Jefferson 9:218
Ft. Worth, Cowtown 9:190
Raymondville, Corral 10:110
San Antonio, San Pedro Outdoor 7:135
San Antonio, Varsity 8:214

Virginia
Hampton, Sydney Lust 8:215
Richmond, Bellwood 7:125
Verona, Staunton 11: 48

Washington
Everett, Everett Motor 10:106
Mount Vernon, Skagit 10:103

West Virginia
Oak Hill, Skyline 11: 41

Wisconsin
Kenosha, Keno Family 9:196
Kenosha, Mid-City 8:226

Roofed, New and Remodeled

Alabama
Florence, Shoals 7:106
Mobile, Loop 3: 77
Tuscumbia, Tuscumbia 9: 46

Arizona
Phoenix, Palms 5: 89

Arkansas
Little Rock, Nabor 5:111
Morritton, Rialto 11: 32
North Little Rock, Park 3: 64

California
Burbank, Cornell 8: 92
Capitola, Capitola 7:138
East Oakland, Hopkins 3: 45
Fresno, Esquire 7:157
Hollywood, Hawaii 2: 77
Inglewood, Academy 2: 69
Inglewood, Fox 8:340
Lakewood Village, Lakewood 8: 16
La Mesa, Helix 7: 90
Long Beach, Crest 5: 39
Los Angeles, Baldwin 8:132
Los Angeles, Hillstreet 6:206
Los Angeles, La Tijera 8: 9
Los Angeles, Paradise 9: 69
Los Angeles, Pickwood 8: 7
Los Angeles, Southside 8: 62
Montebello, Garman 9: 44
Pacific Manor, Sea View 11: 24
Pacific Palisades, Bay 8: 12
Pasadena, Colorado 8: 80
Pittsburgh, Vogue 7:100
Sacramento, Crest 8:150
San Diego, State 2:108
San Francisco, Coronet 8:138
San Francisco, Grand 2:102
San Francisco, Marina 11: 20
San Leandro, Delmar 3:120
Upland, Grove 6:112
Vallejo, Rita 7:114
Ventura, Mayfair 3: 56
Victorville, El Rancho 9: 42

Colorado
Aurora, Fox 5:153
Rifle, Ute 7:104

Connecticut
Bridgeport, Beverly 8: 64
Bristol, Bristol 3: 34
Hamden, Whitney 2: 74
Hartford, Strand 7:174
Madison, Madison 7:182
Ridgefield, Playhouse 2: 89
South Norwalk, Rialto 3:283
Stamford, Avon 2: 92
Stamford, Ridgeway Center 10: 33
Stratford, Hi-Way 8:116
Thompsonville, Strand 7:183
Westport, Fine Arts 2: 76

Delaware
Harrington, Reese 5: 93
Milford, Milford 7: 88
Milford, Shore 5:118
Smyrna, Smyrna 7: 79

District of Columbia
Washington, Apex 3: 21
Washington, MPA Model 8:360
Washington, Naylor 5: 85
Washington, Ontario 10: 84
Washington, Plaza 9: 56
Washington, Village 2:105

Florida
Coral Gables, Miracle 8: 94
Daytona Beach, Daytona 3:101
Fernandina, Ilan 7: 53
Ft. Lauderdale, Gateway 10: 80
Jacksonville, St. Johns 3: 82
Miami, Dixie 7: 84
Miami, Miami 6: 72
Miami Beach, Carib 9: 17
Miami Beach, Miami 3: 61
New Warrington, Navy Point 5: 81
Tampa, State 8:339
West Palm Beach, Florida 8: 72

Georgia
Augusta, Miller 2: 82
Savannah, Savannah 10: 46

Illinois
Chicago, Cinema Annex 8:341
Chicago, Telenews 2: 56
Chicago, Today 3: 48
Franklin Park, Rose 8:175
La Grange, La Grange 8:340
Park Forest, Holiday 9: 54
Pittsfield, Zoe 9: 83
Rock Island, Rocket 2: 58

Indiana
Alexandria, Alex 9: 79
Brook, Brook 8:102
Ft. Wayne, Clyde 10: 50
Indianapolis, Arlington 8: 90
Warsaw, Lake 7: 98

Iowa
Davenport, Esquire 2: 61
Dumont, Dumont 10:121
Holstein, State 7: 54
Mediapolis, Fountainhead 5:165
Osage, Watts 9: 26
St. Ansgar, Roxy 7:145

Kansas
Great Bend, Crest 9: 66
Wichita, Sunset 10: 78

Kentucky
Covington, Madison 6:114
Louisville, Bard 3:126

Louisiana
New Orleans, Carver 9:102
Oak Grove, Fiske 9: 62

Maryland
Baltimore, Colony 8:146
Baltimore, Crest 8: 77
Baltimore, New 5:129
Baltimore, Northwood 9: 21
Baltimore, Senator 2: 37
Baltimore, Town 6: 87
Baltimore, Uptown 3:109
Bethesda, Hiser 2: 63
Bradbury Heights, Coral 7: 82
Cheverly, Cheverly 6: 45
Hyattsville, Hyattsville 2: 29
Langley Park, Langley 10: 94
Lexington Park, Plaza 10: 86
Mount Ranier, Kaywood 5: 73
Salisbury, Boulevard 6:104
Takoma Park, Allen 10: 42
Takoma Park, Flower 8:136

Massachusetts
Attleboro, Union 8:341
Boston, Astor 7:169
Boston, Beacon Hill 7:176
Boston, Circle 2:110
Braintree, Braintree 2: 40
Fall River, Center 3: 42
Fall River, Embassy 6:110
Fall River, Strand 7:180
Framingham, Cinema 10:24; 11:XXX
Southbridge, Strand 7:184
Wareham, Wareham 7:172

Michigan
Birmingham, Bloomfield 3:132
Bronson, Bronson 8:114
Dearborn, Dearborn 3: 53
Detroit, Civic 3:128
Detroit, Harper 2: 50
Detroit, Royal 3: 29
Detroit (Grosse Pointe Woods) Woods 7: 76
Eaton Rapids, Rapids 9: 74
Frankenmuth, Ken 6: 41
Lapeer, Pix 3: 88
Marne, Crown 7:185
Mount Clemens, Emsee 5: 57
Van Dyke, Ryan 8:134

Minnesota
Duluth, Nor Shor 3: 93
Hopkins, Hopkins 3:132
Kiester, Kee 7:145
Minneapolis, RKO Pan 5: 97
Richfield, Richfield 7: 69
Robinsdale, Terrace 10: 36

Mississippi
Brookhaven, Haven 9: 40

Missouri
Kansas City, Roxy 7:155
St. Louis, Tower 7:155

Montana
Libby, Dome 7:120
Missoula, Fox 9: 64

Nebraska

Omaha, Center 10: 60
Scottsbluff, Midwest 5: 77
Superior, Crest 10: 88

Nevada

Las Vegas, Fremont 6: 54

New Hampshire

Hanover, Nugget 10: 48
Littleton, Jax, Jr. 10: 68
Nashua, State 7:169
Newport, Coniston 7:170

New Jersey

Atlantic City, Embassy 3: 66
Cape May, Beach 9: 51
Ft. Lee, Lee 10: 56
Hopewell, Colonial 2: 94
Jersey City, State 7:161
Livingston, Colony 3:104
Passaic, Central 3:106
Pleasantville, Rialto 2: 72
Sparta, Sparta 9: 82
Trenton, Hamilton 6: 37
Wildwood, Strand 6: 81

New Mexico

Albuquerque, Hiland 9: 76
Roswell, Plains 6:120

New York

Albany, Delaware 3: 80
Amsterdam, Tryon 8:148
Baldwinsville, Palace 2: 32
Batavia, Mancuso 7: 72
Brockport, Strand 5:101
Brooklyn, Brook 9: 60
Brooklyn, Clinton 2: 48
Brooklyn, Jewel 11:XXIV
Callicon, Harden 7:143
Elmira, Elmira 11: 30
Flushing, L. I., Mayfair 3: 50
Flushing, L. I., Parsons 8:118
Forest Hills, L. I., Trylon 2: 42
Hempstead, L. I., Calderone 8: 67
Huntington, L. I., Century's Shore 9: 48
Inlet, Gaiety 5:163
Long Island, Lindenhurst 8:100
Long Island, Malverne 6: 63
Long Island, Meadows 8:141
New York, Beekman 11: 34
New York, Circle 3: 74
New York, Fine Arts 10: 82
New York (Bronx), Globe 5: 61
New York, Little Carnegie 10: 91
New York, Normandie 10: 65
New York, Paris 7: 96
New York, Park Avenue 5: 44
Rome, Strand 3:285
Syracuse, Empire 2: 65
Tonawanda, Star 3: 58
Westfield, Grand 3:124

North Carolina

Conover, Canova 3: 72

North Dakota

Medina, Reule 9: 81

Ohio

Ashtabula, Shea's 8:122
Cincinnati, Covedale 6: 48
Cincinnati, Sunset 3: 37
Cincinnati, 20th Century 3:130
Cincinnati, Valley 8: 58
Cincinnati, Westwood 2: 53
Cleveland, Richmond 8:109
Cleveland, Vogue 6: 90
Columbus, Esquire 6: 51
Columbus, Lane 7: 92
Columbus, Old Trail 7:118
Columbus, University 6:124
Cuyahoga Falls, State 9: 30
Dayton, Dabel 6:106
Euclid, Lake 8:144
Fairview, Fairview 7: 86
Marietta, Colony 8:339
Waynesburg, Mohawk 10: 58
Youngstown, Belmont 8:128

Oklahoma

Oklahoma City, Agnew 6: 96
Oklahoma City, Boomer 6:102
Oklahoma City, Harber 10: 53
Oklahoma City, May 6:116
Oklahoma City, Redskin 3:136
Oklahoma City, Will Rogers 6: 93
Tulsa, Will Rogers 3:134

Oregon

Molalla, Molalla 7: 56

Pennsylvania

Charleroi, State 2: 85
Erie, Strand 7:110
Franklin, Kayton 5: 69
Greenville, Jordan 5: 65
Harrisburg, Uptown 8: 84
Jeannette, Harris-Manos 3: 24
Lewistown, Miller 8:170
Mahoningtown, Crescent 3: 90
Mars, Mars 9: 80
Meadville, Park 5:109
Monessen, Manos 7:102
Oakmont, Oaks 3:122
Philadelphia, Aster 2: 80
Philadelphia, Benner 3: 40
Philadelphia, Boro 2:100
Philadelphia, City Line Center 8: 86
Philadelphia, Devon 5: 53
Philadelphia, Goldman 5: 34
Philadelphia, Merben 9: 34; 11: 2
Philadelphia, New Mayfair 9: 78
Philadelphia, Tyson 2: 34
Swarthmore, College 5: 49

Rhode Island

Pawtucket, Center 7:178
Pawtucket, Darlton 3: 26

South Dakota

Brookings, College 3: 69
Custer, Custer 5:168
Sioux Falls, Hollywood 2: 45

Tennessee

Knoxville, Pike 5:169
Memphis, Crosstown 10: 76
Memphis, Plaza 10: 72
Memphis, W. C. Handy 6: 57
Nashville, Tennessee 10: 39

Texas

Atlanta, State 3:116
Brownwood, Bowie 3:112
Dallas, Majestic 8:340
Dallas, Major 6: 60
Dallas, Sunset 6: 84
El Paso, Valley 7:112
Houston, River Oaks 2: 97
Houston, Village 3: 98
Kingsville, Texas 9: 32
Mathis, IT 5:159
Pasadena, Capitan 9: 24
San Antonio, Alameda 8:106

Utah

Bountiful, Bountiful 3:118
Payson, Huish 8:104
Spanish Fork, Arch 8:120

Virginia

Alexandria, Centre 5:114
Alexandria, Vernon 3: 32
Arlington, Glebe 5:116
Colonial Heights, Regent 3:114
Covington, Visulite 2: 87
Hudgins, Donk's 6:108
Mount Jackson, Nelson 6: 75
Roanoke, Lee 3: 96
Richmond, Westover 9: 28
South Hill, Star 7: 56

Washington

Seattle, Magnolia 8: 74
Seattle, Northgate 10: 62

West Virginia

Fairmont, Fairmont 5:105
Huntington, Tipton 6:122
Logan, Guyan 9: 37

Wisconsin

Milwaukee, Strand 8:341
Park Falls, Park 9: 72
Three Lakes, Three Lakes 8: 82
Walworth, Walworth 7:145
White Fish Bay, Fox-Bay 10: 44

Wyoming

Lovell, Hy Art 10: 70

Alaska

Anchorage, Fourth Avenue 6: 33
Fairbanks, Empress 11: 26

Algeria

Algiers, Regent 9: 84

Bermuda

Island 11:XXVIII

Canada

Brampton, Roxy 7: 51
Brantford, Odeon 8:112
Calgary, Marda 11: 28
Edmonton, Paramount 11: 17
(Alberta) Lethbridge, Paramount 9: 58
Montreal, Alouette 11: 22
Montreal, Normandie 6:127
Montreal, Odeon-Champlain 7:122
Ottawa, Odeon 8:125
Quebec, Ahuntsic 6:126
Quebec, Avenue 6:100
Toronto, Odeon 8: 70
Toronto, Odeon-Danford 7: 94
Toronto, Odeon-Fairlawn 6: 78
Toronto, Odeon-Toronto 7: 34
Toronto, University 8: 97
Vancouver, B. C., Fraser 8:339
Vancouver, B. C., Vogue 3: 85
Victoria, Odeon 7:116
West Vancouver, Odeon 7:108

Chile

Valparaiso, Metro 6: 69

Columbia

Barranquilla, Metro 6: 66
Bogota, Mogador 6:118

Cuba

Havana, Duplex 7: 65
Havana, Payret 10: 97
Havana, Rex 7: 65

Denmark

Aarhus, Palads 10:113

England

Harlow New Town, Regal 11: 9

India

Bombay, Embassy Preview 11: 11

Japan

Nagoya City, Nagoya Nikkatso 11: 36

Lebanon

Beyrouth, Capitole 9: 85

Mexico

Mexico City, Chapultepec 9: 86
Mexico City, Linda Vista 8: 14
Mexico City, Nacional 9: 87
San Luis Potosi, El Cine Avenida 6: 98

Peru

Lima, Tacna 7: 43; 11:XXVI

Philippine Islands

Cebu, Star 9: 88
Manila, Republic 6:128

South Africa

Johannesburg, Lyric 10:100

Tunisia

Tunis, Palmarium 11: 38

Venezuela

Caracas, Las Palmas 11: 40